Five-Year Review Report

Fourth Five-Year Review Report
for
Hollingsworth Solderless Terminal Company
Ft. Lauderdale
Broward County, Florida

September 2011

PREPARED BY:

United States Environmental Protection Agency
Region 4
Atlanta, Georgia

Approved by: Date:

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Director, Superfund Division

9/7/11

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
BLS	Below Land Surface
BCEQCB	Broward County Environmental Quality Control Board
CAMU	Corrective Action Management Unit
CDM	Camp Dresser and McKee
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CTL	Cleanup Target Level
DCE	Dichloroethene
DQO	Data Quality Objective
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Difference
FLDEP	Florida Department of Environmental Protection
FYR	Five Year Review
Gpm	Gallons per minute
HSTC	Hollingsworth Solderless Terminal Company
ISB	In-Situ Bioremediation
ISEB	In-Situ Enhanced Bioremediation
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
mg/kg	Milligrams per kilogram
mg/L	milligrams per liter
NADC	Natural attenuation default criteria
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
ppb	Parts per billion
ppm	Parts per million
PRP	Potentially Responsible Party
PVC	Polyvinyl chloride
QAPP	Quality Assurance Project Plan
R4LIMS	Region 4 Laboratory Information Management System
RA	Remedial Action
RAMP	Remedial Action Master Plan
RAO	Remedial Action Objective
RD	Remedial Design
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SFWMD	South Florida Water Management District
SVE	Soil vacuum extraction
t-1,2-DCE	trans-1,2-dichloroethene
TCE	Trichloroethene
TCLP	Toxicity charactertistic and leaching procedure
VOC	Volatile Organic Compound
µg/L	Micrograms per liter

Executive Summary

The remedy for the Hollingsworth Solderless Terminal Company (HSTC) Superfund Site in Ft. Lauderdale, Broward County, Florida included abandonment of the old injection well and all other polyvinyl chloride (PVC) monitoring wells, as well as recovery and treatment of soil, treatment of volatile organic compound (VOC) contaminatedgroundwater. The trigger for this fourth Five-Year Review was the signing of the third Five-Year Review by the Director of the Waste Management Division for the United States Environmental Protection Agency (EPA) Region 4 on December 20, 2005.

The assessment of this Five-Year Review found that the remedy was constructed in accordance with the requirements of the Record of Decision (ROD) and its subsequent amendment. One Explanation of SignificantDifference (ESD) was issued to remove additional contaminated soils, not treated during the original remediation. Two phases of an *in-situ* bioremediation (ISB) pilot test were concluded, designed to address the remaining deeper groundwater contamination associated with Plant #1 of the Site. As a result of the success of this ISB pilot, the 1986 ROD was amended in 2008 to change the groundwater remedy to ISB. In April 2011, a final injection of substrate was accomplished, with the goal of removing the final traces of groundwater contaminants. The remedy at the HSTC Site is protective of human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Hollingsworth Solderless Terminal Company		
EPA ID *(from WasteLAN)*: FLD004119681		
Region: 4	**State:** Florida	**City/County:** Ft. Lauderdale/Broward County

SITE STATUS	
NPL status: ☒ Final ☐ Deleted ☐ Other (specify)	
Remediation status (choose all that apply): ☐ Under Construction ☐ Operating ☒ Complete	
Multiple OUs?* ☐ YES ☒ NO	**Construction completion date:** 06/04/1993
Has site been put into reuse? ☒ YES ☐ NO Site is continuing to be used by a number of tenants.	

REVIEW STATUS	
Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency	
Author name: Galo Jackson	
Author title: Remedial Project Manager	**Author affiliation: U.S. EPA**
Review period**: 04/01/2011 to 06/30/2011	
Date(s) of site inspection: 04/26/2011	
Type of review: ☐ Post-SARA ☒ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion	
Review number: ☐ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (fourth) ☒	
Triggering action: ☐ Actual RA Onsite Construction at OU# ☐ Actual RA Start at OU# ☐ Construction Completion ☒ Previous Five-Year Review Report ☐ Other (specify)	
Triggering action date *(from WasteLAN)*: 12/20/2005	
Due date *(five years after triggering action date)*: 12/20/2010	

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form continued

Issues:

None

Recommendations and Follow-up Actions:

None

Protectiveness Statement:

The remedial actions at the HSTC Site have been almost completely effective in accomplishing the remedial objectives. The remedy implemented at the HSTC Site protects health and the environment in the short term, as well as the long term.

Other Comments:

Environmental Indicators
- Current human exposures at this Site are under control.

Are Necessary Institutional Controls in Place?
☒ All ☐ Some ☐ None

Has the Site Been Designated as Site-Wide Ready for Anticipated Use?
☒ Yes ☐ No

Fourth Five-Year Review Report
Hollingsworth Solderless Terminal Company Superfund Site
Fort Lauderdale, Broward County, Florida

1.0 Introduction

The purpose of the Five-Year Review (FYR) is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports. In addition, FYR reports identify issues found during the review, if any, and identify recommendations to address them.
The U.S. Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental and Liability Act (CERCLA) Section 121 andthe National Contingency Plan (NCP). CERCLA Section 121 states:

"If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews."

EPA interpreted this requirement further in the NCP; Title 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii) states:

> "If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action."

The EPA Region 4 conducted the FYR of the remedy implemented at the HSTC Superfund Site in Ft. Lauderdale, Florida. This review was conducted by the EPA Region 4 for the entire Site from April 2011 through June 2011. The EPA is the lead agency for developing and implementing the remedy of this Fund-financed clean-up of the Site. The Florida Department of Environmental Protection (FDEP), as the support agency representing the State of Florida, has reviewed all supporting documentation and provided input to the EPA during the FYR process.

This is the fourth FYR for the HSTC Site. The triggering action for this policy review is the signing of the third FYR in December 2005. The FYR is required because hazardous substances, pollutants, or contaminants remain at the Site, marginally above levels that allow for unlimited use and unrestricted exposure.

2.0 Site Chronology

Event	Date
Manufactured solderless electrical terminals.	1968 – 1982
Initial investigations regarding environmental issues began when the Broward County Environmental Quality Control Board (BCEQCB).	1977 – 1980
The BCEQCB requested assistance from the EPA under CERCLA.The HTSC subsequently filed for Chapter 11 Bankruptcy Status inNovember 1981.	1981
The Site was listed final on the National Priorities List (NPL).	1983
The EPA subsequently conducted the feasibility study and issued a Record of Decision (ROD).	1986
The final remedial design (RD) was completed in May 1988	1988 – 1993
Preliminary Close-Out Report	6/1993
Long-term response actions were completed with the demobilization ofthe groundwater treatment system.	1994
First FYR	1/1996
CDM Federal Programs conducted a Geoprobe investigation to further characterize a suspected source area located on the south side of Plant #1.	6/1999
Second FYR	4/2000
Final supplemental remedial investigation report issued.	6/2001
An Explanation of Significant Differences (ESD) was issued by the EPA, with concurrence from the FDEP.	10/2001
Remediation of the South and West Drainfield commenced through excavation and removal of the contaminated soil.	2/2002
Shaw Environmental, Inc. developed an in-situ bioremediation pilot testfor the areas of the South and West Drainfields, associated with Plant #1 of the	6/2003
A bioremediation pilot test was conducted by Shaw Environmental, Inc.	4-6/2005

Site Chronology (continued)

Event	Date
Third FYR	12/2005
1986 ROD Amendment	11/2008
Bioremediation RD concluded	11/2009
Bioremediation Remedial Action (RA) concluded	04/2011

3.0 Background

3.1 Physical Characteristics

The Hollingsworth Site is located at 700 NW 57th Place in the City of Fort Lauderdale, Broward County, Florida. The Site consists of approximately 3.5 acres and is occupied by two buildings separated by NW 57th Place. The Site is bounded by asphalt and dirt alleyways and a mixture of commercial and light industrial properties. The southern building at the Site, formerly known as Plant #1, is presently occupied by a number of small businesses. The northern buildingat the Site, formerly known as Plant #2, was occupied by Kabinet Co. A general location map is presented on Figure 1. A map of the approximate locations of the monitoring wells found during the document review for this fourth FYR is shown on Figure 2. The Site is located within the 100 year flood plain and is topographically flat.

3.2 Land and Resource Use

Hydrogeology

The City of Fort Lauderdale's primary water supply, the Prospect Well Field, is located approximately two miles west of the Site. The production wells closest to the HSTC Site are located within a quarter to a half mile. The Prospect Well Field taps into the Biscayne aquifer for water supply.This aquifer, which also underlies the Site, is highly permeable, unconfined, and is composed of limestone and sandstone. In the vicinity of the Site, the top of the aquifer is near ground surface, and its base is approximately 200-to-250 feet below ground surface. The upper 60-to-70 feet of the aquifer are primarily composed of fine-to-medium grained sands. These sands, in turn, are underlain by a transition zone of cemented shell and sandstone, and finally by the limestone layer which forms the major water producing zone of the Biscayne aquifer. Underlying the Biscayne aquifer is a relatively impermeable sequence of clay and marl of the Hawthorn Formation, approximately 400 feet thick. The Hawthorn Formation serves as a confining unit between the Biscayne aquifer and the brackish water of the underlying Floridan aquifer. The regional direction of groundwater flow is to the southeast.

Surface Water

The Atlantic Ocean is located approximately five miles to the east of the Site, and the Everglades lie approximately 10 miles to the west. Cypress Creek Canal is locatedapproximately one and a half miles to the north and the Middle River Canal two miles to thesouth. The average rainfall for this area is approximately 60 inches per year. The Site is located within the 100 year flood plain and is topographically flat.

3.3 History of Contamination

From 1968 until 1982, HSTC manufactured solderless electrical terminals, consisting of a conductive metal portion and a plastic sleeve. The manufacturing process included heat treatment in molten salt baths,degreasing, and electroplating. For approximately eight years, the company disposed of washwater and process wastewater contaminated with trichloroethene (TCE)

and heavy metals into drain fields and an injection well located onsite, resulting in contamination of soil and groundwater.

3.4 Initial Response

Enforcement and Compliance

Initial investigations regarding environmental issues began in 1977 when the Broward County Environmental Quality Control Board (BCEQCB) began investigating the disposal practices of the HSTC facility. In 1980, during a routine inspection, the BCEQCB discovered that the HSTC was contaminating groundwater by disposing of process wastes into an injection well. Subsequently, in June of 1981, the BCEQCB requested assistance from the EPA under CERCLA. The HTSC subsequently filed for Chapter 11 Bankruptcy Status in November 1981.

Site History

The EPA conducted a Site Assessment and developed a Remedial Action Master Plan in 1982. The Site was listed as final on the National Priorities List in 1983. The HTSC conducted several preliminary studies to further characterize the site, and then initiated scaled-down remedial investigation activities in 1983. The EPA subsequently conducted the feasibility study and issued a ROD in 1986. Additional sampling was conducted by the EPA in February 1987, which led to an effort to excavate and treat contaminated source soil. Due to heavy rain and high water levels, the soil removal effort was abandoned. The final RD was completed in May 1988 and was implemented during the period from December 1989 through June 1993. Long term response actions were completed in November 1994 with the demobilization of the groundwater treatment system, as ordered by the EPA, with concurrence from the State of Florida.

3.5 Basis for Taking Action

Basis for Taking Action: Clean-up goals specified in the 1986 ROD include:

Soil			Groundwater	
Target Contaminant	**Cleanup Goal**		**Target Contaminant**	**Cleanup Goal**
Copper	10.0 mg/L[1]		Vinyl chloride	1.0 µg/L
Nickel	1.0 mg/L		Trans-1,2-dichloroethene	70.0 µg/L
Lead	0.5 mg/L		Trichloroethene	3.2 µg/L
Total VOCs	1.0 mg/kg[1]			

Notes: Leachchable concentration, as determined by EPTOX
mg/L = milligrams per liter
mg/kg = milligrams per kilogram
µg/L = micrograms per liter

The primary contaminants of concern associated with potential health risks which were identified in the ROD (1986) are as follows: vinyl chloride, TCE, trans 1,2-dichloroethene (t-1,2DCE), and to a lesser extent, nickel, tin, and copper.

Six additional contaminants were detected in 1987, which were not considered contaminants of concern with respect to health risks, but which cleanup goals were established for during the remedial design. These contaminants are: 1, 1-dichloroethane; 1,2-dichloroethane;1,1-dichloroethene; cis-1,2-dichloroethene; tetrachloroethene; and 1,1,2-trichloroethane. Metals were not detected above the ROD performance standards during the 1987 investigation, and therefore were not considered as contaminants of concern in the final remedial design.

The criteria for determining whether the groundwater levels met remediation goals were the concentrations of the identified contaminants in the treated effluent. Cleanup goals for groundwater remediation were developed based on the 10^{-6} cancer risk, the State of Florida primary drinking water standards, and proposed MCLs. The cleanup goal for soil was established at one mg/kg for total VOCs.

Based on the results of the public health evaluation reported in the ROD, there were no complete pathways for exposure by direct contact, ingestion, or inhalation of contaminants from the Hollingsworth Site. However, there was a probable pathway associated with direct contact with soil if any future excavation is conducted. There is also a potential for future exposure via installation of private irrigation wells or industrial supply wells down-gradient of the Site. No known installation of private irrigation wells or industrial supply wells down-gradient has occurred since the signing of the ROD in 1986, as of the time of completion of this fourth FYR report.

Lifetime cancer risk factors associated with exposure to potentially carcinogenic chemicals in groundwater were calculated and reported in the ROD for vinyl chloride and TCE. There is no cancer slope factor available for cis- and trans-1,2-DCE. At present, the cancer risk for vinyl chloride associated with ingestion of groundwater (hypothetical future scenario) exceeds the 10^{-4} threshold in a few of the Site's monitoring wells and is considered unacceptable.

4.0 Remedial Action

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria include:

1. Overall Protectiveness of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume of Contaminants through Treatment
5. Short-term Effectiveness

6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

4.1 Remedy Selection

The remedial action objectives stated in the 1986 ROD, were to prevent further migration of contaminated groundwater into the Biscayne aquifer by cleaning-up existing contamination in the aquifer and to remove the sources of contamination from overlying soil and drainfields. Since groundwater contamination at the Site is the primary concern, determining the extent of contamination and establishing a target zone for soil and groundwater remediation was key to accomplishing remedial objectives. Soil remediation was to focus on removal of volatile contaminants in the East Drainfield, the only source of contamination believed to require treatment at that time.

The selected remedy, as stated in the ROD, includes the following components:

- Proper abandonment of the old injection well and all other PVC wells on-site;
- Treatment of VOC contaminated soil on-site;
- Treatment of VOC contaminated groundwater on-site; and
- Injection of treated groundwater near the Site.

This remedy was selected because it was determined that it could meet the cleanup goals and the objectives of the remedial response for the lowest cost, using proven technology.

A first FYR was completed in January 1996. Periodic groundwater monitoring has continued to the present. In June 1999, CDM Federal Programs conducted a Geoprobe investigation to further characterize a suspected source area located onthe south side of Plant #1. The second FYR was completed in April 2000 and cited the results from this 1999 Geoprobe study for its recommendation that additional soil remediation was required to meet the goals of the ROD. Additionally, the second FYR recommended that the remedy for groundwater contamination be re-evaluated due to the continued presence of high levels of contamination in monitoring wells B, C, and D; which are all located on the southern side of Plant #1.

As a result of the preceding, the EPA conducted a supplemental remedial investigation (RI). The Supplemental RI report was finalized in June 2001. This report concluded that, while the EPA had previously remediated what was at the time recognized as the most highly contaminated area, the East Drainfield, groundwater and soil characterization suggested the presence of additional residual sources.These sources were the South Drainfield and the West Drainfield, with its septic tank. During rising groundwater events, the groundwater would come in contact with this contaminated soil,thus causing the detection of contaminants in monitoring wells B, C and D. While earlier remediation had significantly decreased the groundwater contamination around the Hollingsworth Site, the goals of the ROD would not be achieved if these contaminated soils in the South and West Drainfield were not more thoroughly addressed. Additionally, the Supplemental RI Report concluded that there was evidence that conditions existed, which are

conducive for biodegradation of the chlorinated organic contaminants.

In response to these findings, an Explanation of Significant Differences (ESD) was issued by the EPA in October of 2001, with the concurrence of the Florida Department of Environmental Protection. This ESD specified that, in order to meet and maintain groundwater cleanup goals permitting the eventual removal of the HSTC Site from the National Priorities List, residual subsurface sources of VOCs needed to be removed. In February 2002, remediation of the South and West Drainfield commenced through excavation and removal of the contaminated soil in these areas. Excavation was performed as deep as possible (approximately 8-to-9 feet below ground surface (bgs), given that the fine-to-medium grain sands began flowing at this depth. Due to the flowing sands at this depth, the full extent of the contaminated soil could not be removed.

Sampling of a subset of groundwater monitoring wells following the soil removal showed that, although the shallow (20 ft bgs) wells met the ROD's goals, the intermediate depth wells (50 ft bgs) did not. As a consequence, through the U.S. Army Corps of Engineers, Shaw Environmental, Inc., was subcontracted to develop remedial options, which included in-situ chemical oxidation and enhanced bioremediation. Following review of both these options by the EPA and FDEP, Shaw Environmental, Inc, was tasked to develop an in-situ bioremediation pilottest for the areas of the South and West Drainfields, associated with Plant #1 of the Site. The Pilot Test Work Plan, Former Hollingsworth Solderless Terminal Site, was completed on December 2004. This bioremediation pilot test was conducted from April through June 2005.

On November 24, 2008, the EPA issued a ROD Amendment. The ROD Amendment changed the remedy from pump and treat to in-situ enhanced bioremediation.

4.2 Remedy Implementation

Soil Remediation

During the remedial design phase in 1987, additional field studies were undertaken to supplement and verify available Site data. In February 1987, the EPA Emergency Response Contractor (ERC) attempted to excavate and remediate contaminated soil from the East Drainfield area, as part of an interim removal action. The plan was to excavate the East Drainfield to a depth of four feet, aerate the removed soil with a backhoe; and replace treated soil into the excavation. This attempt proved unsuccessful due to a high water table and unseasonably heavy rain. Strong odors were observed from the groundwater in the excavation, and it was decided that it would be of little use to treat and replace soil back into the excavation, where it would again be re-contaminated due to contact with contaminated groundwater. Soil excavation and treatment efforts were subsequently abandoned. The difficulties encountered by the EPA-ERC provided the EPA with enough information to develop a more effective design for remediating contaminated soil. The remediation technology selected was a soil vacuum extraction (SVE) system.

Based on the selected remedial action, which by then included a revised plan for soil remediation, Camp Dresser and McKee, Inc., (CDM) prepared and submitted a revised Remedial Design Report in February 1988. Soil remediation was to be accomplished prior to groundwater

remediation, so that contaminated soils would not continue to impact groundwater during remediation.

In 1989, Westinghouse Remediation Services, Inc., designed and installed the SVE system in a 14' x 12' area of the East Drainfield, which was put into operation in January 1991. The SVE system treated soils in the unsaturated zone. Soil samples collected in July 1991 (to a depth of 12 feet bgs) from the East Drainfield area provided verification that the soil vapor removal system had reduced TCE concentrations below the cleanup goal of one part per million (ppm). The SVE system was subsequently dismantled in March 1992. A subsequent review of the ROD revealed that total VOC concentrations were to be remediated to concentrations lessthan one ppm, not just TCE. Additional soil samples were collected in March 1993 (to a depth of five feet bgs) verified that the soil vapor extraction system had also remediated total VOC concentrations below the cleanup goal of one ppm in the unsaturated zone.

Per recommendations made in the 1999 second FYR, 182 tons of soil in the West and South Drainfields were excavated and removed from the Site. This was completed in February 2002. Based on the results of the toxicity characteristic leaching procedure (TCLP) analyses performed on the excavated soil, all 182 tons of soils were trucked to a non-hazardous landfill at the Central Sanitary Landfill & Recycling Center in Pompano Beach, FL. Forty four tons of Portland cement-stabilized sludge were found to be hazardous as a result of TCLP testing. Following an evaluation of competitive bids, this cement-stabilized sludge was shipped to the Chemical Waste Management, Inc. facility in Emelle, AL. Subsequent to this and in order to meet the ROD's groundwater remediation goals, an in-situ enhanced bioremediation pilot test was initiated in April 2005 and continued through June 2005. Results of this pilot test found promising and the 1986 ROD was amended in 2008, to permit final bioremediation treatment of the source areas.

Groundwater Remediation

Construction of the groundwater treatment system was completed by December 1991. The system was comprised of three wells capable of extracting 150 gallons per minute (gpm) each, an air-stripping tower capable of 450 gpm of flow, and two injection wells into which treated effluent was injected into the Biscayne aquifer. The system startup and shakedown was completed on July 17, 1992. Effluent samples collected on August 16, 1994 indicated that the treatment system discharge was not meeting the permit requirements. It was determined that the failure was due to fouling of the packing material in the air stripper. The treatment system was shut down on August 17, 1994. In November 1994, the groundwater treatment system was removed from the Site, as ordered by the U.S. EPA with concurrence from the State of Florida.

The groundwater treatment system was designed based on an estimated removal and treatment of approximately 180 million gallons of water. During its period of operation, the groundwater treatment system averaged flow rates between 280 and 350 gpm. The influent concentrations of the contaminants of concern, measured as total VOC concentrations, were reduced from 12,500 µg/L (7/15/92) to 480 µg/L (10/27/92). Groundwater samples collected from Y-series and Z-series wells indicated that contaminant levels were consistently below the required cleanup levels. However, groundwater samples collected from monitoring wells installed near the East Drainfield and in the portion of the aquifer suspected to be most contaminated showed

contaminant levels consistently above the required cleanup levels. The groundwater treatment system was shut down and removed prior to the accomplishment of the remediation objectives for groundwater. In order to meet the ROD's groundwater remediation goals, an in-situ enhanced bioremediation pilot test was initiated in April 2005 through June 2005. Results of this pilot test were promising and the 1986 ROD was amended to permit additional bioremediation.

Because groundwater contaminant concentrations were found marginally above the amended ROD's goals, in order to gain State concurrence for the delisting of the Site from the NPL, during the week of April 25, 2011 injection of liquid substrates by direct-push, permanent injection wells took place. A slow-release/slow-fermentation product 3DMe™ was used, which is designed for either injection or in biobarrier trenching. Direct-push methods (e.g, Geoprobe®) are suitable for shallow groundwater applications ($\leq$ 50 feet bls) in unconsolidated formations. The HSTC Site hydrology and depth to groundwater are suitable for direct-push delivery. Direct-push does not leave a permanent well point in place. Since the slow-release/slow-fermentation substrates may require infrequent or possibly even no re-injection following the initial delivery, direct-push was believed to be the best option.

Injection well spacing and location was determined by the permeability of the formation, the lateral distribution characteristics of the substrate, the direction and flow of groundwater. Typical slow-release substrates allow injection spacing between 5 and 15 feet and up to 50 feet in high permeability recirculation systems. The South Drainfield plume at the HSTC Site, with an estimated square footage of 1,500 was effectively covered by eight injection points, on a 15 foot between points spacing. The shape of the conceptual plume, the building footprint, and the direction of groundwater flow determined the placement of the direct-push points. The West Drainfield, with both scattered pockets of contamination and questionable areas lacking definitive analytical data will require no fewer than 15 injection points to provide confidence. The northeast corner of the West Drainfield plume apparently extends underneath the southwest corner of Plant 1. However, based on the then most current data (May 2009), only VC was detected, but at levels close to the FDEP groundwater clean-up target level (CTL) of one µg/L, under Plant #1, at IW-10. Thus, from practical standpoint, no further treatment is deemed necessary underneath the southwest corner of Building B.

Once the substrate was pressure injected, the system then becomes passive, allowing natural groundwater flow and direction to carry the substrate. A passive system should require no further O&M beyond performance monitoring for several years.

4.3 Operation & Maintenance (O&M)

The operational period of the groundwater remediation system was July 1992 through August 1994. The treatment system was removed from the Site in November 1994. An in-situ enhanced bioremediation pilot test operated from April 2005 through June of 2005. Therefore, aside from periodic sampling of the monitoring wells, there are no ongoing operation and maintenance activities associated with groundwater remediation.

5.0 Progress Since Last Five-Year Review

The Protectiveness Statement from the 2005 FYR was:

> "The remedial actions at the HSTC Site have not been completely effective in accomplishing the remedial objectives. The remedy implemented at the HSTC Site is protective in the short term. Contaminants are still present in the groundwater. No known industrial or private wells exist within the known plume of contamination around the HSTC Site. The issues noted during this review do not appear to be immediate threats to the protectiveness human health and the environment. However, future excavations or the installation of additional wells around the HSTC Site could cause a threat to the protectiveness of human health and the environment. The old injection well is still not properly abandoned, as required by the ROD. The old injection well has been buried, but not properly abandoned. As such, it is no longer an immediate threat via indiscriminate dumping of wastes; but the well could be acting as a conduit for cross contamination between zones. An in-situ bioremediation pilot test was developed and implemented for the areas of the South and West Drainfields, associated with Plant #1 of the HSTC Site. This bioremediation pilot test was conducted from April through June 2005. The effectiveness of this remedy could not be evaluated in this third Five-Year review as the data is not currently available.
>
> The most immediate threat to the protectiveness of the HSTC Site are monitoring wells not being properly secured or wells being damaged. More inspection and maintenance of the groundwater monitoring well network needs to be incorporated into an O&M program. Low value monitoring wells need to be properly abandoned, and the old injection well needs to be properly abandoned.
>
> Long-term protectiveness of the remedial action should be verified by obtaining additional groundwater sample locations to fully evaluate potential migration of the contaminant plume down gradient (west and south) from Plant #1. These additional sample locations will also be vital in evaluating the effectiveness of the bioremediation remedy. Current data indicate that the excavation and removal of the contaminated soils in the South and West drainfields during February 2002 has significantly reduced groundwater contaminants. However, visible contaminants remained at the eight feet bgs depth after excavations were completed. As a consequence, Shaw Environmental, Inc., was tasked to develop an in-situ bioremediation pilot test for the areas of the South and West Drainfields, associated with Plant #1 of the HSTC Site. This bioremediation pilot test was conducted from April through June 2005. The bioremediation will need to continue to be monitored to judge the effectiveness of long term protection offered by this remedy."

The 2005 FYR included eight issues and corresponding recommendations. The status of each are described below.

Progress on Recommendations from the 2005 FYR

Section	Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
5.1	Proper abandonment of injection well	EPA	December 2006	Injection well abandoned by the EPA	October 2006
5.2	Attain remedial action objectives	EPA	June 2006	AROD, RD and RA completed	pending
5.3	Routine inspection of wellheads.	EPA	June 2006	Wells inspected during routine sampling	semi-annually
5.4	Groundwater monitoring wells not clearly marked	EPA	June 2006	Not completed	
5.5	One monitoring well not secured.	EPA	June 2006	All wells are currently secured.	Not known
5.6	A monitoring well near Plant 2 was found damaged.	EPA	June 2006	Damaged well repaired	October 2006
5.7	No QAAP available	EPA	September 2007	QAAP prepared for all activities since 3rd FYR	N/A
5.8	Abandonment of low-value monitoring wells	EPA	September 2007	Pending	

5.1 Abandonment of Old Injection Well

One of the remedial objectives, as stated in the ROD, was to properly abandon the injection well used by HSTC in the 1970s. In May 1993, Ebasco Environmental, Inc. attempted to locate the injection well, but was unsuccessful. During the first FYR conducted by Roy F. Weston, Inc., in 1996, it was noted that the injection well still existed on the west side of Plant #1, and that apparently it had not been abandoned. It was also noted in Weston's 1996 report that the well could be acting as a conduit for cross-contamination between zones. During the Site inspection for the second FYR, June 1999, the injection well could not be located. Records searched during the 1999 second FYR found no mention of the well being properly abandoned. The second FYR recommended that this well be found using a geophysical survey and that the well be properly abandoned. While an excavator was available during the 2002 for removal of the western

septic tank and South Drainfield, it was used to find the injection well. It was located and photographed. Since then, the well had been covered-over, presumably by the building owners. In October 2006, the old injection well was located and decommissioned. Details of the old injection well abandonment are contained in the November 7, 2006 memorandum entitled Old Injection Well Decommissioned at Hollingsworth Solderless Superfund Site. The memo provides details on how the Portland cement was placed using a treamie line from the bottom of the well's casing to the top of the well casing.

5.2 Refurbishing of the Damaged Monitoring Wells

Two damaged monitoring wells were refurbished in October 2006. Both monitoring wells were inspected with a down-hole camera prior to being refurbished. Details of this work are provided in the November 7, 2006 memorandum entitled Refurbished Damaged Monitoring wells at the Hollingsworth Superfund Site.

5.3 In-Situ Enhanced Bioremediation (ISEB) Pilot Test

Startup testing of the ISEB system occurred on April 8, 2005. The system was not brought online until April 14, 2005. All but three of 42 drums of lactate were injected by the end of June 2005. In addition, bioaugmentation, thorough the injection of three, five gallon kegs of the bacteria *Dehalococcoides ethanogens* was completed by April 19, 2005.

Due to significantly elevated contaminant concentrations found in a number of the monitoring points, as a result of the August 2005 post-injection sampling, additional sampling was proposed as part of this pilot-scale treatability study. This sampling was designed both to determine the nature of the geochemical environment 300 days after initiation of lactate injection, as well as to determine whether any unrecognized high concentrations source areas remained, which were mobilized by the re-circulation of groundwater. Any remaining source area would have to be degraded by chemical oxidation or other more aggressive means.

In February 2006, additional groundwater and subsurface soil sampling took place. Soil results indicated that no apparent unrecognized source area remained. In addition, groundwater results were encouraging. Data resulting from the February 2006 sampling, or approximately 300 days post lactate injection were encouraging for the following reasons:

- the aquifer had become far more anaerobic (very low oxidation reduction potential);
- the aquifer had lower dissolved oxygen;
- methane concentration were elevated; and
- *Dehalococcoides* populations remained high.

As a consequence, it was decided to inject additional lactate, in order to produce the fatty acids that would, in turn, nourish the microbes that are present, thereby producing more ethene. An additional 24 drums (14,400 pounds) of lactate were injected between May though mid-June 2006.

5.4 Amendment to 1986 ROD and Bioremediation Remedial Design

As a result of the positive outcome of the enhanced *in-situ* bioremediation pilot study, the 1986 ROD was amended in 2008 to permit additional and final treatment of the remaining, limited areas with cis-1,2'dichlorethene and vinyl chloride, the two Site-related contaminants above either the State of Florida MCL or Natural Attenuation Default Criterion. Following completion of the 2008 amended ROD, a remedial design was undertaken and completed in November 2009.

Because groundwater contaminant concentrations were found marginally above the 2008 amended ROD's goals, in order to gain State concurrence for the delisting of the Site from the NPL, during the week of April 25, 2011 injection of liquid substrates by direct-push, permanent injection wells took place. A slow-release/slow-fermentation product 3DMe™ was used, which is designed for either injection or in biobarrier trenching. Direct-push methods (e.g, Geoprobe®) are suitable for shallow groundwater applications ($\leq$ 50 feet bls) in unconsolidated formations. The HSTC Site hydrology and depth to groundwater are suitable for direct-push delivery. Direct-push does not leave a permanent well point in place. Since the slow-release/slow-fermentation substrates may require infrequent or possibly even no re-injection following the initial delivery, direct-push was believed to be the best option.

6.0 Five-Year Review Process

6.1 Administrative Components

The EPA Region 4 initiated the FYR in April 2011 and scheduled it for completion on or before August 30, 2011. The review team was led by Galo Jackson of the EPA, Remedial Project Manager (RPM) for the HSTC Site. The review team consisted of the following people:

- Galo Jackson, RPM
- Caroline Philson, EPA Attorney
- Tonya Spencer, Community Involvement Coordinator (CIC)
- Chris Pellegrino, FDEP

6.2 Community Involvement

Activities designed to involve the community in this Five Year Review included interviews with the tenants occupying Plant 1 and 2, as well as interviews with neighboring businesses. A notice of the start of this Five Year Review was sent to the main local newspaper, the South Florida Sun-Sentinel. This notice was run in April 2011.

The Five-Year Review report will be made available to the public once it has been finalized. Copies of this document will be placed in the designated public repository: Broward County Public Library, 100 S. Andrews Ave. - Level 5, Ft. Lauderdale, FL. On April 28, 2011, as part of the Site inspection, the EPA RPM visited the Broward County Public Library. Site related documents were found in the Government Documents section of the library. The most recent documents included the Administrative Record for the ROD Amendment which was finalized in November 2008. Upon completion of the FYR, a public notice will be placed in *Sun Sentinel* to announce the availability of the final FYR report in the Site document repository.

6.3 Document Review

This Five-Year review consisted of a review of relevant documents, including monitoring data. Applicable soil and groundwater cleanup standards, as listed in the 2008 amended Record of Decision, were reviewed (see Attachments 1 and 2).

ARARs Review

Section 121 (d)(2)(A) of CERCLA specifies that Superfund remedial actions must meet any federal standards, requirements, criteria, or limitations that are determined to be legally ARARs. Applicable or Relevant and Appropriate Requirements are those standards, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, action, location, or other circumstance at a CERCLA site. To-Be-Considered criteria (TBCs) are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary level of cleanup for protection of human health or the environment. While TBCs do not have the status of ARARs, the EPA's approach to determining if a remedial action is protective of human health and the environment involves

consideration of TBCs along with ARARs. Chemical-specific ARARs are specific numerical quantity restrictions on individually listed contaminants in specific media. Examples of chemical-specific ARARs include the MCLs specified under the Safe Drinking Water Act (SDWA) as well as the ambient water quality criteria that are enumerated under the Clean Water Act. Because there are usually numerous contaminants of potential concern for any site, various numerical quantity requirements can be ARARs.

The final remedy selected for this Site was designed to meet or exceed all chemical-specific ARARs and meet location- and action-specific ARARs. Chemical-specific ARARs identified in the selected remedy within the ROD and subsequent ROD Amendment and considered for this FYR for continued treatment and monitoring are listed below. The State of Florida primary drinking water standards for the Hollingsworth Soldeless Terminal Site's contaminants of concern are different from the federal primary drinking standards.

Comparison of Groundwater ARARs

Contaminants of Concern	1998 ROD Cleanup Levels (µg/L)	2008 ROD Amendment Cleanup Levels (µg/L)	Current State ARARs (µg/L)	ARARs changed?
Trichloroethene	3.2	3.0	3.0	No
Vinyl chloride	1.0	1.0	1.0	No
cis-1,2-dichloroethene	none	70.0	70.0	No
trans-1,2-dichloroethene	70.0	100.0	100.0	No

6.4 Data Review

Since the 2005 third FYR, the Site has been sampled on eight occasions, in order to monitor the conditions in the aquifer and to determine any trends in contaminant concentrations. Figures 4 through 11 show the cis-1,2-dichloroethene and vinyl chloride results for the performance monitoring wells, the injection wells and the recovery wells. Only those two contaminants have been found over the past five years above the State of Florida clean-up target levels (CTL) or the natural attenuation default criterion (NADC). The CTL and NADC for cis-1,2-dichloroethene are 70 and 700 ppb, respectively. The CTL and NADC for vinyl chloride are 1 and 100 ppb, respectively. During the most recent (November 2010) sampling of the Site's monitoring wells, only one out of the 23 wells sampled was found to be above the NADC for vinyl chloride and only five additional wells had vinyl chloride concentrations that were above the CTL. This well was recovery well RW-2, which had a concentration of 120 ppb vinyl chloride, or 20 ppb above the State NADC for vinyl chloride. In November 2010, none of the monitoring wells were found above the CTL for cis-1,2-dichloroethene.

6.5 Site Inspection

The Five-Year Review Site inspection for the HSTC Site was held on April 28, 2011. The Site

inspection was conducted by Galo Jackson, USEPA, Region 4 Remedial Project Manager. During the Site inspection, a walk-through of the Site was conducted. The walk-through was limited to the outside property of Plant #1 and both inside and outside of Plant #2.

The SVE system was removed from the Site in March 1992. The groundwater remediation system was removed in November 1994. The bioremediation system beginning to be in April 2005, two months after the previous Site inspection took place. The constructed re-circulation system has since been removed, after operating for months. During the current Site inspection, there was little to inspect, except for the existing monitoring wells. All of the monitoring wells appeared functional. Caps and locks were observed on all the monitoring wells. Some cover plates on flush mounted wellheads were not bolted down. Monitoring wells at the HSTC Site were not clearly marked and labeled. The periphery of the Plant #1 was paved with asphalt orconcrete, except for a grass area on the north side of the building. The north side of Plant #1 canbe seen on Figure 3.

The Site Inspection Checklist is presented in Attachment 3.

6.6 Interviews

The majority of the small businesses located on or near the Site are not aware of the former Site's existence. Most of them have moved into the former Plant #1 and Plant #2 buildings since the last Five Year Review. For this reason, interviews were limited to County, State and the Plant #1 building owner.

Dr. Harvey Schneider, Broward County

1.What is your overall impression of the project?
The EPA has done an excellent job in assessing and remediating the Hollingsworth Solderless Terminal Site. When it was determined that a localized plume of solvents was still present at the site, the EPA project manager recognized the need to perform additional remediation and did so. However, I believe sufficient time and money have been spent to remediate this site. The remediation efforts need to end.

2. What effects have site operations had on the surrounding community?
I am not aware of any effects the site operations have had on the surrounding community. I have been the EPA Superfund Coordinator for Broward County for nearly 20 years and I have not received any public inquiry about this site.

3. Are you aware of any community concern regarding the site or its operation and administration?
I am not aware of any community concern regarding the site or its operation and administration. I have been the EPA Superfund Coordinator for Broward County for nearly 20 years and I have not received any public inquiry about this site.

4. Do you feel well informed about the site's activities and progress?
Broward County contacts the EPA project manager every three months to receive information

about the site's activities. In addition, the EPA project manager contacts Broward County when site activities are scheduled and welcomes site visits from the county. We are well informed about the site's activities and progress.

5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
The EPA project manager has done an excellent job maintaining communications with local government. He has been proactive in pursuing the completion of site remediation.

The EPA project manager has explained to me that low levels of solvents remain at two locations on the source property and the contaminants are not found beyond the boundaries of the source property. If this is correct and low concentration contaminants remain on-site, then the site remediation needs to be concluded. The site is as cleaned up as it is going to get using reasonably priced technology. The EPA and FDEP should put a deed restriction on the property and let natural conditions clean up the remnant contaminants.

Mr. Christopher Pellegrino, Project Manager, FDEP

1. What is your overall impression of the project?
I believe that the project is ongoing in a effective manner.

2. What effects have site operations had on the surrounding community?
Site operations have had a positive impact on the risk to the surrounding community.

3. Are you aware of any community concern regarding the site or its operation and administration?
No

4. Do you feel well informed about the site's activities and progress?
Yes

5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
No

Plant #1 Property Owner

1. What is your overall impression of the project?
Mr. Jackson has been my primary point of contact with the agency and he has always been very responsive, professional and courteous.

2. What effects have site operations had on the surrounding community?
Diminished property values, but otherwise no visible impact of which I am aware.

3. Are you aware of any community concern regarding the site or its operation and administration?

Other than reduction of property values, no.

4. Do you feel well informed about the site's activities and progress?
Yes, Mr. Jackson has always promptly responded to my inquiries.

5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
It is a shame the project took so long, but I am not qualified to comment on whether the amount of time was overly long or about right.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, risk assumptions, and the results of the Site inspection indicates that the remedy is functioning as intended by the original ROD, as modified by the ESD and ultimately the 2008 ROD amendment. The results from sampling the monitoring wells after bioremediation pilot test, have indicated progressive, if not slow, decline in contaminant concentrations to the point where, in the past two years, only vinyl chloride has been detected at concentrations that exceed NADC (and CTL) values.

As a result of the HSTC Site being designated a delineated area, pursuant to Chapter 62-524 of the Florida Administrative Code, an institutional control in the form of restrictions on the installation of new potable water wells is in place. Figure 10 of the third FYR shows the extent of the area delineated, pursuant to Rule 62-524.430. Rules 62-524-550, 62-524.600, 62-524-650 and62-524.700 impose restrictions on well construction, water quality testing, and permitting ofgroundwater well located in delineated areas.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy, since the 2008 ROD amendment was finalized.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures (older child trespasser, adult trespasser) and potential future exposures (young and older future child resident, future adult resident and future adult worker). The remedy has progressed to the point that all soil and groundwater cleanup goals have been met, with the exception of the goal for vinyl chloride. In November 2010, vinyl chloride was detected at trace concentrations, with a maximum concentration of 2.4 µg/L inside Plant 1 and 120 µg/L outside Plant1 (Figure 11). Figures 4 through 11 shown that only vinyl chloride has been detected at trace concentrations since early 2006, hence vapor intrusion is not likely to be of concern at this point in the Site's history.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No ecological targets were identified during the baseline risk assessment and none were identified during this five-year review, and therefore monitoring of ecological targets is not necessary. There is no other information that calls into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

According to the data reviewed, the Site inspection, and the interviews, the remedy is functioning as intended by the ROD, as modified by the ESD and ROD amendment. There have been no changes in the physical conditions of the Site that would affect the protectiveness of the

remedy. ARARs for soil contamination due to metals as cited in the ROD and AROD have been met. ARARs for soil contamination due to VOCs as cited in the ROD have been met within the first few feet (~ 8 feet) of soil and are capped with either concrete or asphalt. Groundwater contamination due to VOC has been reduced, but still remains, albeit at low concentrations. A bioremediation pilot remedy has been implemented, designed to remediate the remaining groundwater contaminants. Many of the Site's monitoring wells need to be abandoned. There is no other information that calls into question the protectiveness of the remedy.

8.0 Issues

No issues were identified as a result of this FYR that affect current or future protectiveness of the remedy. However, in order to optimize the remedy and prepare for Site closure, it is recommended that the existing well network be evaluated and certain wells abandoned according to applicable well abandonment protocol. Because this is considered part of routine O&M, it will not be tracked in CERCLIS.

9.0 Recommendations and Follow-Up Actions

No issues were identified as a result of this FYR that affect current or future protectiveness of the remedy. However, in order to optimize the remedy and prepare for Site closure, it is recommended that the existing well network be evaluated and certain wells abandoned according to applicable well abandonment protocol. Because this is considered part of routine O&M, it will not be tracked in CERCLIS

10.0 Protectiveness Statement

The remedial actions at the HSTC Site have been almost completely effective in accomplishing the remedial objectives. The remedy implemented at the HSTC Site protects health and the environment in the short term, as well as the long term.

11.0 Next Review

The HSTC Site requires a policy review every five years, until the cleanup goals are achieved. The fifth five-year review report is due to be approved within five years of the date of the signature of this report. In the likely event that that HSTC Site is deleted from the NPL before the fifth FYR is due, the deletion documentation will specify that no further FYRs will be required.

TABLES

TABLE 1

Volatile Organic Analysis and Total Organic Carbon Results
November 2010
HOOLLINGSWORTH SOLDERLESS TERMINAL SITE

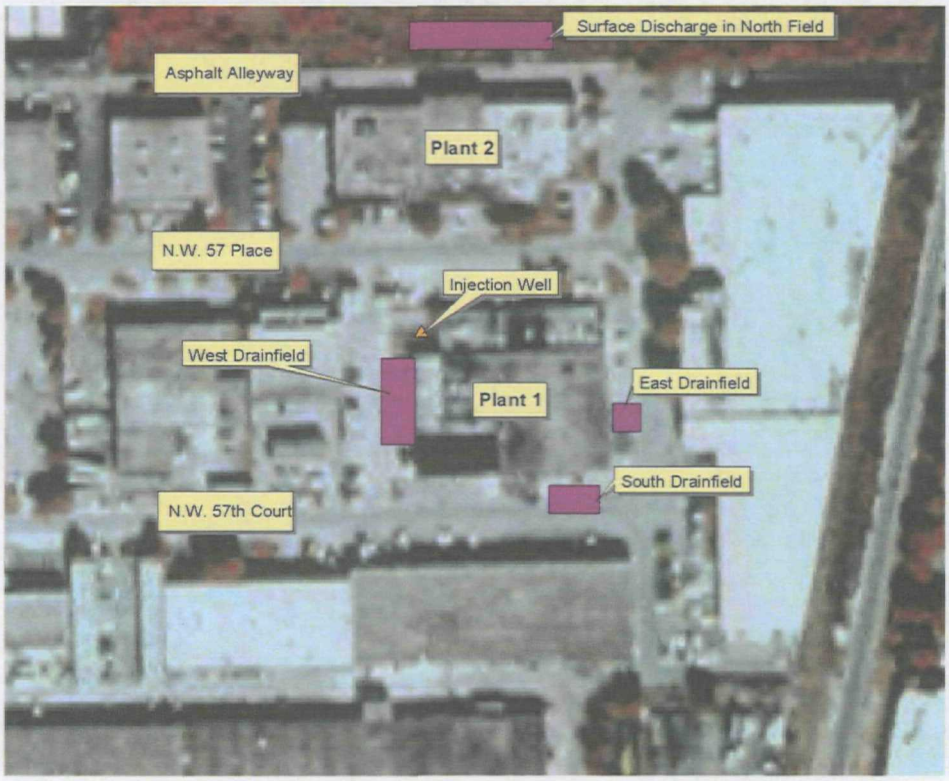
Station Identification	cis-1,2-DCE µg/L	trans-1,2-DCE µg/L	TCE µg/L	VC µg/L	TOC mg/L
IW-1	—	—	—	1.1	30 P-3
IW-3	0.10 J, Q-2, T1	—	—	0.022 T-1	NA
IW-5	0.25 J, Q-2	—	—	0.46	NA
IW-7	0.18 J, Q-2, T-1	—	—	0.24 T-1	8.8 J, P-3, QM-2
IW-8	0.13 J, Q-2	—	—	0.084	18 P-3
IW-11	0.39 J, Q-2	—	—	2.4	110 P-3
IW-12	—	—	—	0.022	NA
IW-14	0.20 J, Q-2, T-1	—	—	1.0 T-1	NA
IW-16	—	—	—	0.097 T-1	NA
PMW-1	38 T-1	1.8 T-1	—	36 T-1	100 P-3
PMW-2	—	—	—	0.032 T-1	NA
PMW-3	1.3 T-1	0.29 J, Q-2, T-1	—	T-1	46 P-3
PMW-4	0.24 J, Q-2, T-1	—	—	0.071 T-1	56 P-3
PMW-5	0.63 T-1	—	—	0.98 T-1	22 P-3
PMW-6	—	—	—	0.11	NA
PMW-7	0.28 J, Q-2, T-1	—	—	0.10 T-1	12 P-3
PMW-8	—	—	—	0.19 T-1	NA
RW1	7.7	0.47 J, Q-2	1.4	3.8	18 P-3
RW2	17	2.2	0.13 J, Q-2	120	NA

Notes:

— – Non Detect
NA – Not Analyzed.
J – The identification of the analyte is acceptable; the reported value is an estimate.
OM-2 – Matrix Spike Recovery greater than method control limits.
P-3 – Sample received unpreserved.
Q-2 – Results greater than Minimum Detection Limit but less than Minimum Reportable Limit.
T-1 – Sample received in cooler with temperature blank greater than 6 °C.
DCE – Dichloroethene
TCE – Trichloroethene (Trichloroethylene)
VC – Vinyl Chloride

FIGURES

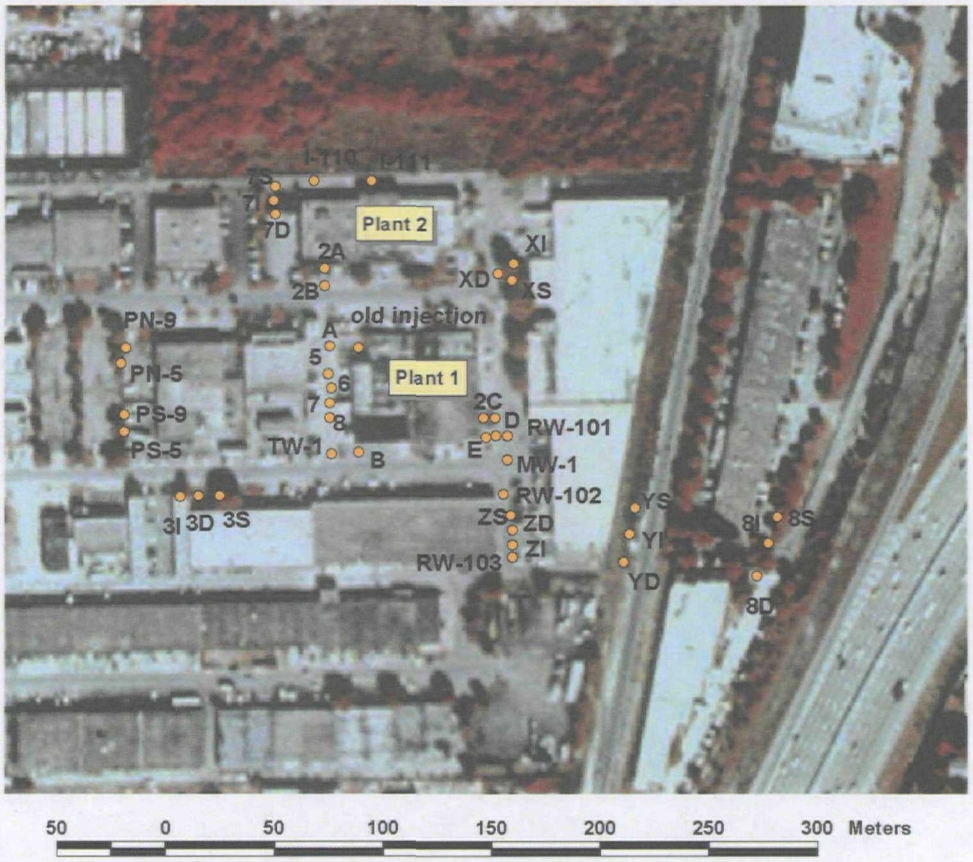
Figure 1: Hollingsworth Solderless (General Locations)



Drainfield locations approximate and referenced from first Five-Year Review report.

Injection Well location approximate and not found during Second or Third Five-Year Review.

Figure 2: HSTC Historic Groundwater Monitoring



Groundwater monitoring locations approximate. Locations derived through inspection of Site Layout Map found in First Five-Year Review report.

Injection Well location approximate and not found during Second or Third Five-Year Review.

FIGURE 3

Plant #1: April 2011

Figure 4

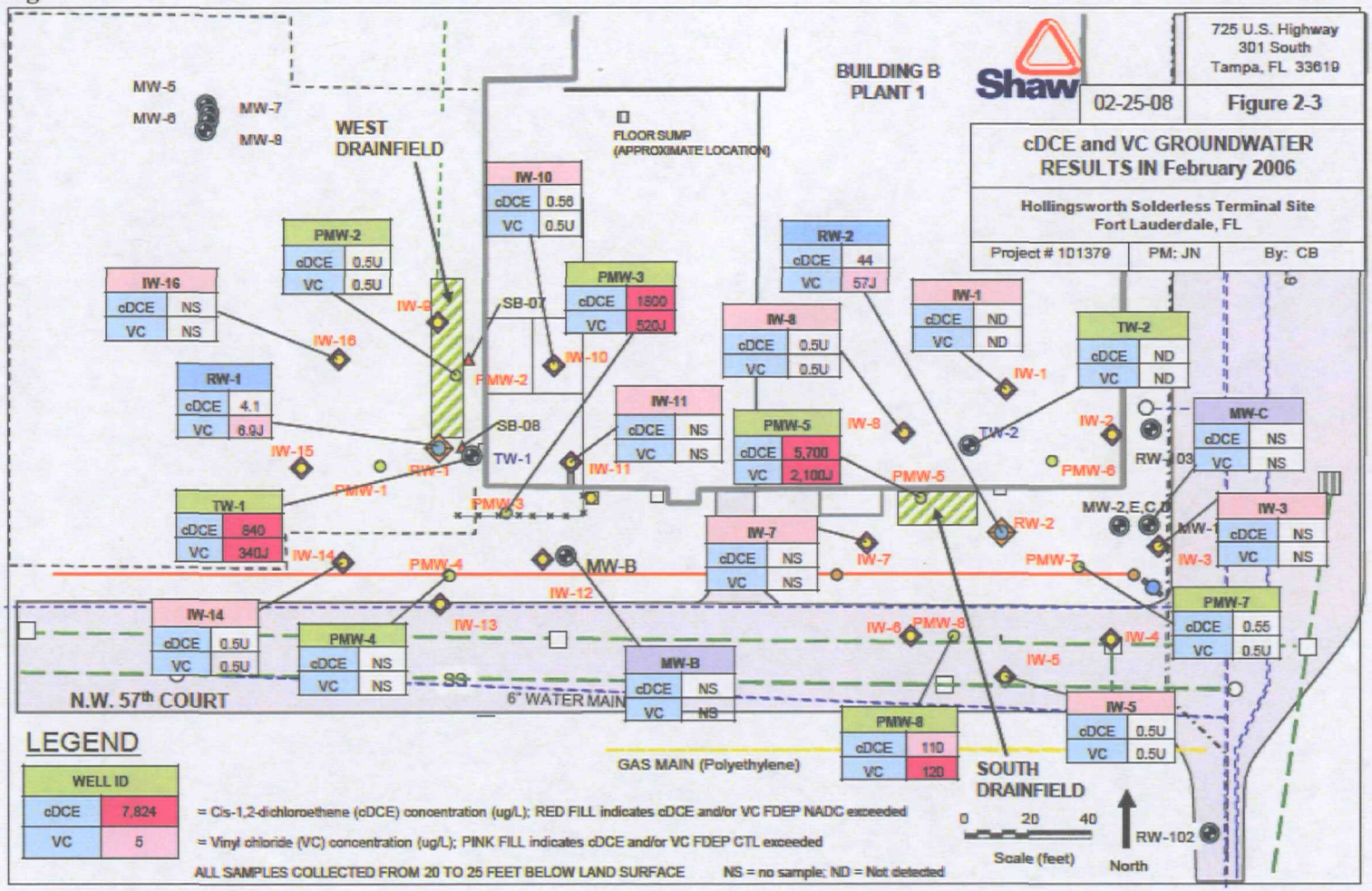

725 U.S. Highway 301 South Tampa, FL 33619
02-25-08
Figure 2-3
cDCE and VC GROUNDWATER RESULTS IN February 2006
Hollingsworth Solderless Terminal Site
Fort Lauderdale, FL
Project # 101379
PM: JN
By: CB
BUILDING B PLANT 1
WEST DRAINFIELD
FLOOR SUMP (APPROXIMATE LOCATION)
MW-5
MW-6
MW-7
MW-8
IW-10 cDCE 0.56 VC 0.5U
PMW-2 cDCE 0.5U VC 0.5U
PMW-3 cDCE 1800 VC 520J
RW-2 cDCE 44 VC 57J
IW-16 cDCE NS VC NS
IW-1 cDCE ND VC ND
IW-8 cDCE 0.5U VC 0.5U
TW-2 cDCE ND VC ND
RW-1 cDCE 4.1 VC 6.9J
IW-11 cDCE NS VC NS
PMW-5 cDCE 5,700 VC 2,100J
MW-C cDCE NS VC NS
TW-1 cDCE 840 VC 340J
IW-7 cDCE NS VC NS
IW-3 cDCE NS VC NS
IW-14 cDCE 0.5U VC 0.5U
PMW-4 cDCE NS VC NS
MW-B cDCE NS VC NS
PMW-7 cDCE 0.55 VC 0.5U
PMW-8 cDCE 110 VC 120
IW-5 cDCE 0.5U VC 0.5U
SB-07
SB-08
TW-1
RW-103
MW-2,E,C,D
MW-1
N.W. 57th COURT
6" WATER MAIN
SS
GAS MAIN (Polyethylene)
SOUTH DRAINFIELD
LEGEND
WELL ID
cDCE 7,824
VC 5
= Cis-1,2-dichloroethene (cDCE) concentration (ug/L); RED FILL indicates cDCE and/or VC FDEP NADC exceeded
= Vinyl chloride (VC) concentration (ug/L); PINK FILL indicates cDCE and/or VC FDEP CTL exceeded
ALL SAMPLES COLLECTED FROM 20 TO 25 FEET BELOW LAND SURFACE
NS = no sample; ND = Not detected
0 20 40
Scale (feet)
North
RW-102

Figure 5

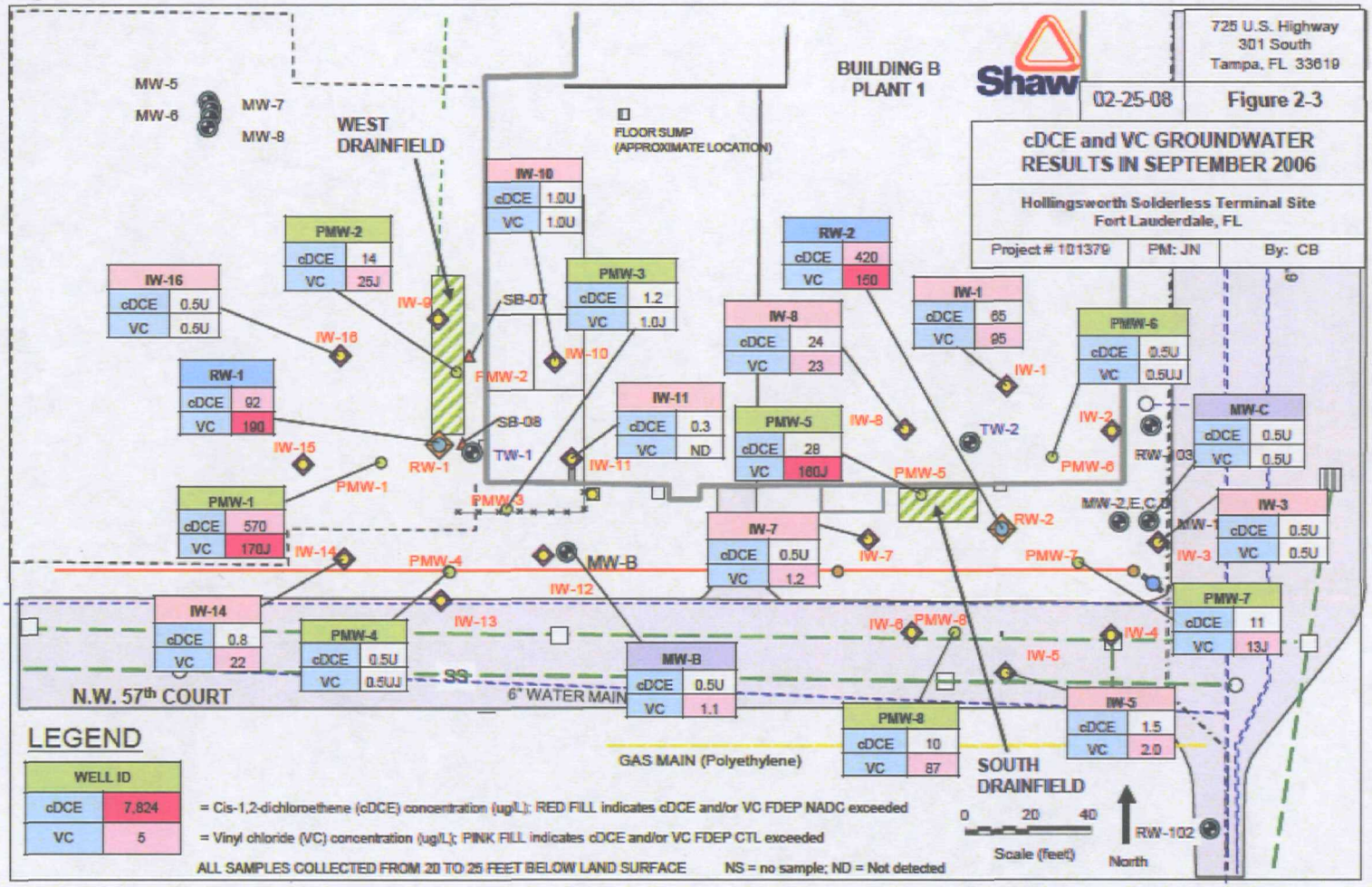

725 U.S. Highway 301 South Tampa, FL 33619
02-25-08
Figure 2-3
cDCE and VC GROUNDWATER RESULTS IN SEPTEMBER 2006
Hollingsworth Solderless Terminal Site Fort Lauderdale, FL
Project # 101379 PM: JN By: CB
BUILDING B PLANT 1
FLOOR SUMP (APPROXIMATE LOCATION)
WEST DRAINFIELD
SOUTH DRAINFIELD
N.W. 57th COURT
SS
6" WATER MAIN
GAS MAIN (Polyethylene)
MW-5
MW-6
MW-7
MW-8
IW-10 cDCE 1.0U VC 1.0U
PMW-2 cDCE 14 VC 25J
PMW-3 cDCE 1.2 VC 1.0J
RW-2 cDCE 420 VC 150
IW-16 cDCE 0.5U VC 0.5U
IW-1 cDCE 65 VC 95
IW-8 cDCE 24 VC 23
PMW-6 cDCE 0.5U VC 0.5UJ
RW-1 cDCE 92 VC 190
IW-11 cDCE 0.3 VC ND
PMW-5 cDCE 28 VC 180J
MW-C cDCE 0.5U VC 0.5U
PMW-1 cDCE 570 VC 170J
IW-7 cDCE 0.5U VC 1.2
IW-3 cDCE 0.5U VC 0.5U
IW-14 cDCE 0.8 VC 22
PMW-4 cDCE 0.5U VC 0.5UJ
MW-B cDCE 0.5U VC 1.1
PMW-7 cDCE 11 VC 13J
PMW-8 cDCE 10 VC 87
IW-5 cDCE 1.5 VC 2.0
LEGEND
WELL ID
cDCE 7,824
VC 5
= Cis-1,2-dichloroethene (cDCE) concentration (ug/L); RED FILL indicates cDCE and/or VC FDEP NADC exceeded
= Vinyl chloride (VC) concentration (ug/L); PINK FILL indicates cDCE and/or VC FDEP CTL exceeded
ALL SAMPLES COLLECTED FROM 20 TO 25 FEET BELOW LAND SURFACE
NS = no sample; ND = Not detected
0 20 40
Scale (feet)
North
RW-102

Figure 6

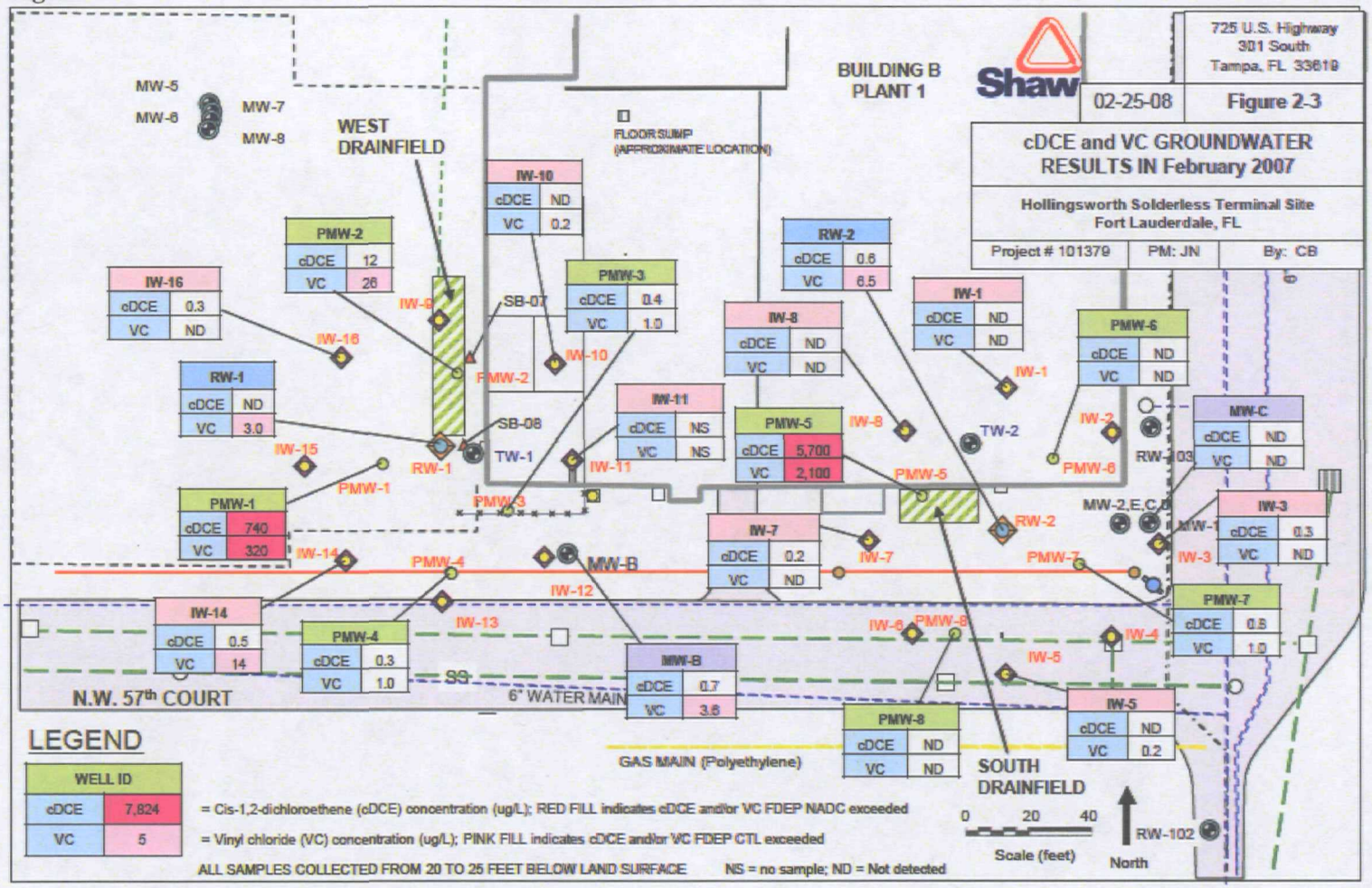

725 U.S. Highway 301 South Tampa, FL 33619
02-25-08
Figure 2-3
cDCE and VC GROUNDWATER RESULTS IN February 2007
Hollingsworth Solderless Terminal Site Fort Lauderdale, FL
Project # 101379
PM: JN
By: CB
BUILDING B PLANT 1
WEST DRAINFIELD
FLOOR SUMP (APPROXIMATE LOCATION)
SOUTH DRAINFIELD
N.W. 57th COURT
6" WATER MAIN
GAS MAIN (Polyethylene)
MW-5
MW-6
MW-7
MW-8
IW-10 cDCE ND VC 0.2
PMW-2 cDCE 12 VC 26
PMW-3 cDCE 0.4 VC 1.0
RW-2 cDCE 0.6 VC 6.5
IW-16 cDCE 0.3 VC ND
IW-1 cDCE ND VC ND
IW-8 cDCE ND VC ND
PMW-6 cDCE ND VC ND
RW-1 cDCE ND VC 3.0
IW-11 cDCE NS VC NS
PMW-5 cDCE 5,700 VC 2,100
MW-C cDCE ND VC ND
PMW-1 cDCE 740 VC 320
IW-7 cDCE 0.2 VC ND
IW-3 cDCE 0.3 VC ND
IW-14 cDCE 0.5 VC 14
PMW-4 cDCE 0.3 VC 1.0
MW-B cDCE 0.7 VC 3.6
PMW-8 cDCE ND VC ND
PMW-7 cDCE 0.5 VC 1.0
IW-5 cDCE ND VC 0.2
LEGEND
WELL ID
cDCE 7,824
VC 5
= Cis-1,2-dichloroethene (cDCE) concentration (ug/L); RED FILL indicates cDCE and/or VC FDEP NADC exceeded
= Vinyl chloride (VC) concentration (ug/L); PINK FILL indicates cDCE and/or VC FDEP CTL exceeded
ALL SAMPLES COLLECTED FROM 20 TO 25 FEET BELOW LAND SURFACE
NS = no sample; ND = Not detected
0 20 40
Scale (feet)
North
RW-102

Figure 7

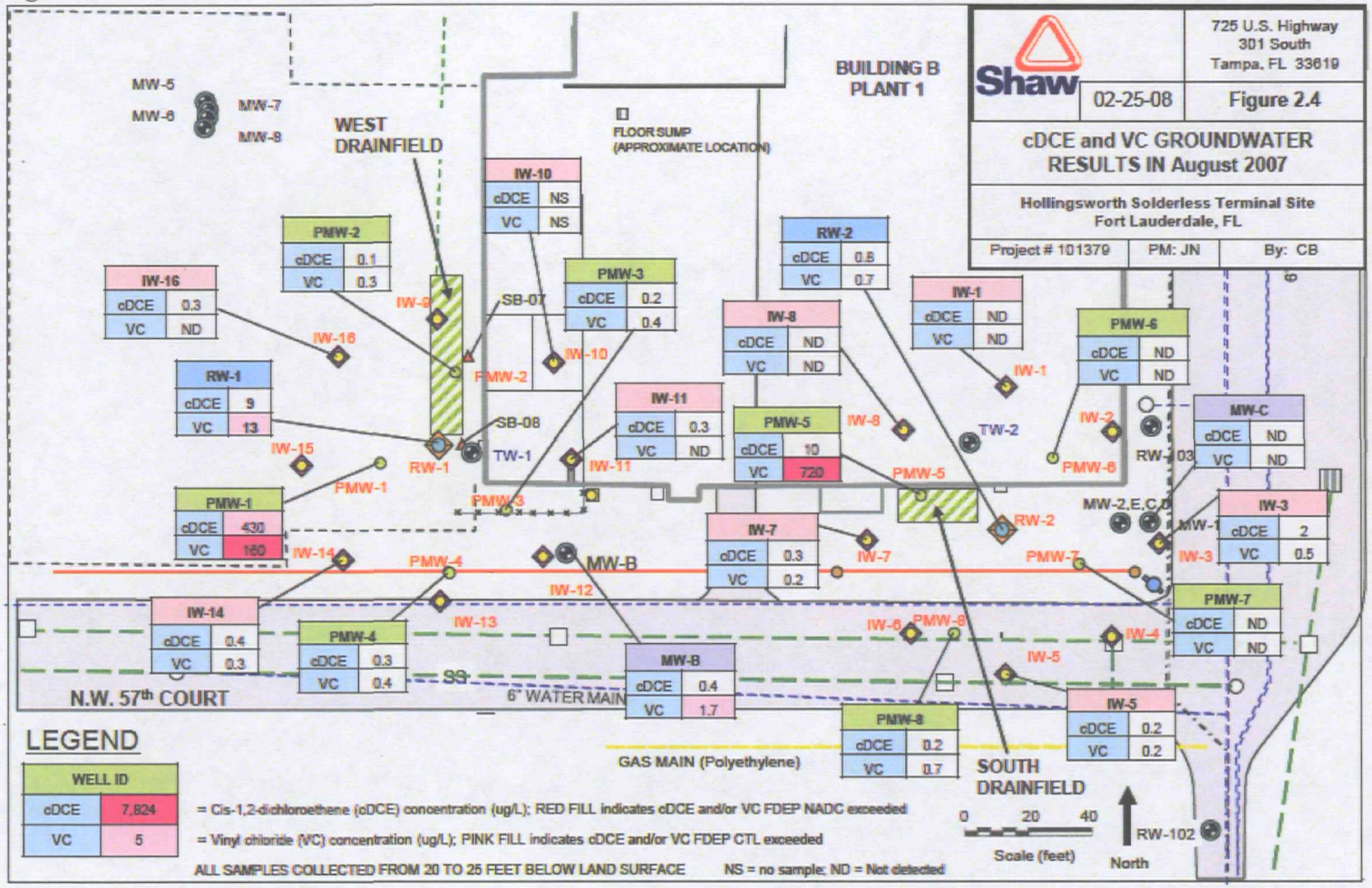

Shaw
725 U.S. Highway 301 South Tampa, FL 33619
02-25-08
Figure 2.4
cDCE and VC GROUNDWATER RESULTS IN August 2007
Hollingsworth Solderless Terminal Site
Fort Lauderdale, FL
Project # 101379
PM: JN
By: CB
BUILDING B PLANT 1
FLOOR SUMP (APPROXIMATE LOCATION)
WEST DRAINFIELD
SOUTH DRAINFIELD
MW-5
MW-6
MW-7
MW-8
IW-10 cDCE NS VC NS
PMW-2 cDCE 0.1 VC 0.3
PMW-3 cDCE 0.2 VC 0.4
RW-2 cDCE 0.8 VC 0.7
IW-16 cDCE 0.3 VC ND
IW-1 cDCE ND VC ND
IW-8 cDCE ND VC ND
PMW-6 cDCE ND VC ND
RW-1 cDCE 9 VC 13
IW-11 cDCE 0.3 VC ND
PMW-5 cDCE 10 VC 720
MW-C cDCE ND VC ND
PMW-1 cDCE 430 VC 160
IW-7 cDCE 0.3 VC 0.2
IW-3 cDCE 2 VC 0.5
PMW-7 cDCE ND VC ND
IW-14 cDCE 0.4 VC 0.3
PMW-4 cDCE 0.3 VC 0.4
MW-B cDCE 0.4 VC 1.7
IW-5 cDCE 0.2 VC 0.2
PMW-8 cDCE 0.2 VC 0.7
SB-07
SB-08
TW-1
TW-2
RW-03
MW-2,E,C,D
MW-1
IW-2
IW-4
IW-6
IW-9
IW-12
IW-13
IW-15
PMW-1
PMW-2
PMW-3
PMW-4
PMW-5
PMW-6
PMW-7
PMW-8
RW-1
RW-2
SS
6" WATER MAIN
GAS MAIN (Polyethylene)
N.W. 57th COURT
LEGEND
WELL ID
cDCE 7,824
VC 5
= Cis-1,2-dichloroethene (cDCE) concentration (ug/L); RED FILL indicates cDCE and/or VC FDEP NADC exceeded
= Vinyl chloride (VC) concentration (ug/L); PINK FILL indicates cDCE and/or VC FDEP CTL exceeded
ALL SAMPLES COLLECTED FROM 20 TO 25 FEET BELOW LAND SURFACE
NS = no sample; ND = Not detected
0 20 40
Scale (feet)
North
RW-102

Figure 8

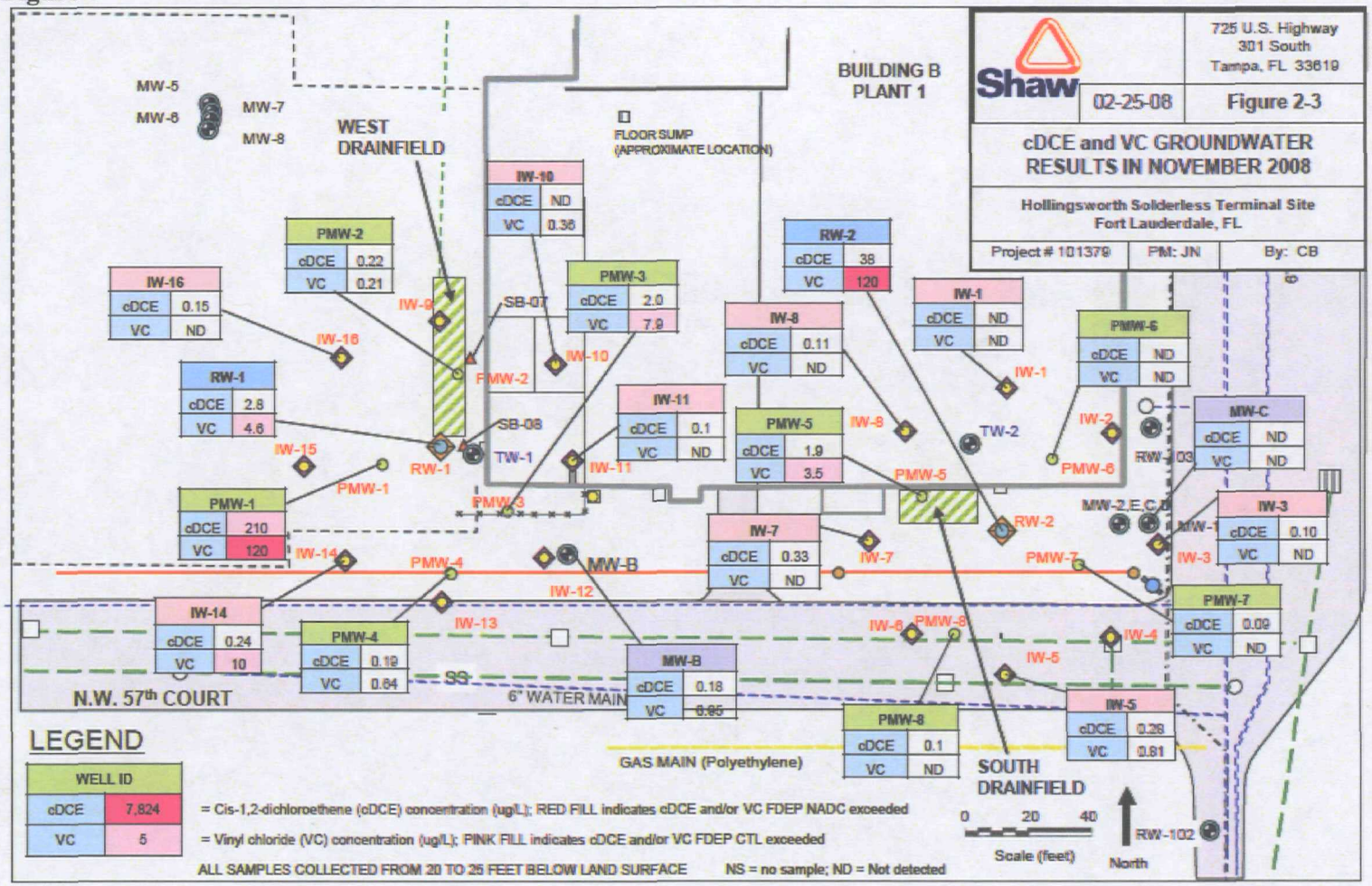

Shaw
725 U.S. Highway 301 South Tampa, FL 33619
02-25-08
Figure 2-3
cDCE and VC GROUNDWATER RESULTS IN NOVEMBER 2008
Hollingsworth Solderless Terminal Site Fort Lauderdale, FL
Project # 101379 PM: JN By: CB
BUILDING B PLANT 1
FLOOR SUMP (APPROXIMATE LOCATION)
WEST DRAINFIELD
SOUTH DRAINFIELD
MW-5
MW-6
MW-7
MW-8
IW-16 cDCE 0.15 VC ND
PMW-2 cDCE 0.22 VC 0.21
IW-10 cDCE ND VC 0.36
PMW-3 cDCE 2.0 VC 7.9
RW-2 cDCE 38 VC 120
IW-1 cDCE ND VC ND
PMW-6 cDCE ND VC ND
RW-1 cDCE 2.8 VC 4.6
IW-11 cDCE 0.1 VC ND
IW-8 cDCE 0.11 VC ND
PMW-5 cDCE 1.9 VC 3.5
MW-C cDCE ND VC ND
PMW-1 cDCE 210 VC 120
IW-7 cDCE 0.33 VC ND
IW-3 cDCE 0.10 VC ND
PMW-7 cDCE 0.09 VC ND
IW-14 cDCE 0.24 VC 10
PMW-4 cDCE 0.19 VC 0.64
MW-B cDCE 0.18 VC 0.85
PMW-8 cDCE 0.1 VC ND
IW-5 cDCE 0.28 VC 0.81
SB-07
SB-08
TW-1
TW-2
MW-2 E,C,D
RW-103
RW-102
N.W. 57th COURT
6" WATER MAIN
SS
GAS MAIN (Polyethylene)
LEGEND
WELL ID
cDCE 7,824
VC 5
= Cis-1,2-dichloroethene (cDCE) concentration (ug/L); RED FILL indicates cDCE and/or VC FDEP NADC exceeded
= Vinyl chloride (VC) concentration (ug/L); PINK FILL indicates cDCE and/or VC FDEP CTL exceeded
ALL SAMPLES COLLECTED FROM 20 TO 25 FEET BELOW LAND SURFACE
NS = no sample; ND = Not detected
0 20 40
Scale (feet)
North

Figure 9

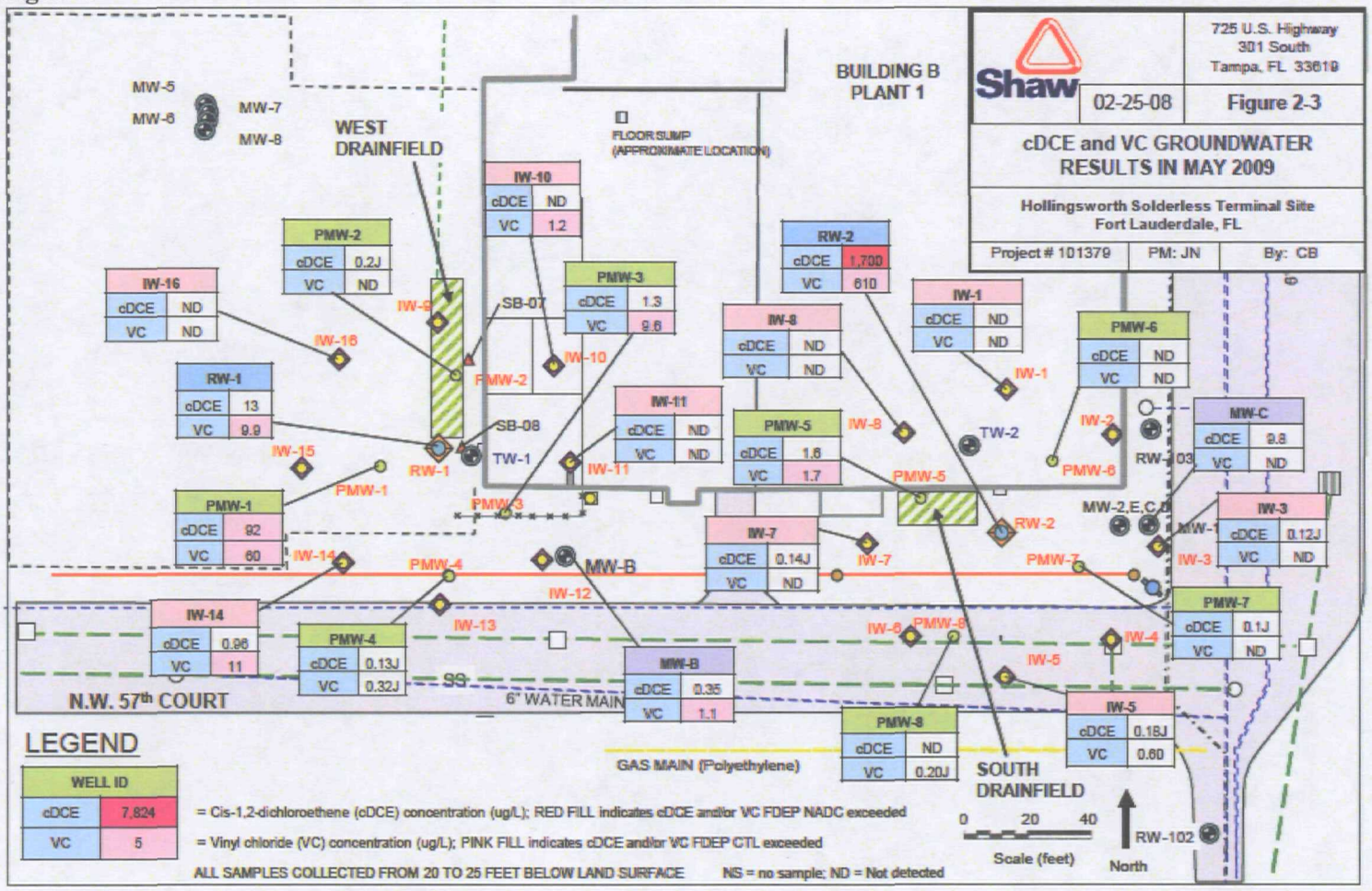

Shaw
725 U.S. Highway 301 South Tampa, FL 33619
02-25-08
Figure 2-3
cDCE and VC GROUNDWATER RESULTS IN MAY 2009
Hollingsworth Solderless Terminal Site Fort Lauderdale, FL
Project # 101379
PM: JN
By: CB
BUILDING B PLANT 1
FLOOR SUMP (APPROXIMATE LOCATION)
WEST DRAINFIELD
SOUTH DRAINFIELD
N.W. 57th COURT
6" WATER MAIN
SS
GAS MAIN (Polyethylene)
MW-5
MW-6
MW-7
MW-8
IW-10 cDCE ND VC 1.2
PMW-2 cDCE 0.2J VC ND
PMW-3 cDCE 1.3 VC 9.6
RW-2 cDCE 1,700 VC 610
IW-16 cDCE ND VC ND
IW-8 cDCE ND VC ND
IW-1 cDCE ND VC ND
PMW-6 cDCE ND VC ND
RW-1 cDCE 13 VC 9.9
IW-11 cDCE ND VC ND
PMW-5 cDCE 1.6 VC 1.7
MW-C cDCE 9.8 VC ND
PMW-1 cDCE 92 VC 60
IW-7 cDCE 0.14J VC ND
IW-3 cDCE 0.12J VC ND
PMW-7 cDCE 0.1J VC ND
IW-14 cDCE 0.86 VC 11
PMW-4 cDCE 0.13J VC 0.32J
MW-B cDCE 0.35 VC 1.1
PMW-8 cDCE ND VC 0.20J
IW-5 cDCE 0.18J VC 0.60
SB-07
SB-08
TW-1
TW-2
RW-1
RW-2
RW-103
RW-102
MW-2,E,C,D
IW-9
IW-16
IW-10
PMW-2
IW-15
PMW-1
IW-14
PMW-4
IW-12
IW-13
IW-11
PMW-3
IW-8
PMW-5
IW-1
PMW-6
IW-2
PMW-8
IW-7
PMW-7
IW-3
IW-4
IW-5
IW-6
LEGEND
WELL ID
cDCE 7,824
VC 5
= Cis-1,2-dichloroethene (cDCE) concentration (ug/L); RED FILL indicates cDCE and/or VC FDEP NADC exceeded
= Vinyl chloride (VC) concentration (ug/L); PINK FILL indicates cDCE and/or VC FDEP CTL exceeded
ALL SAMPLES COLLECTED FROM 20 TO 25 FEET BELOW LAND SURFACE
NS = no sample; ND = Not detected
0 20 40
Scale (feet)
North

Figure 10

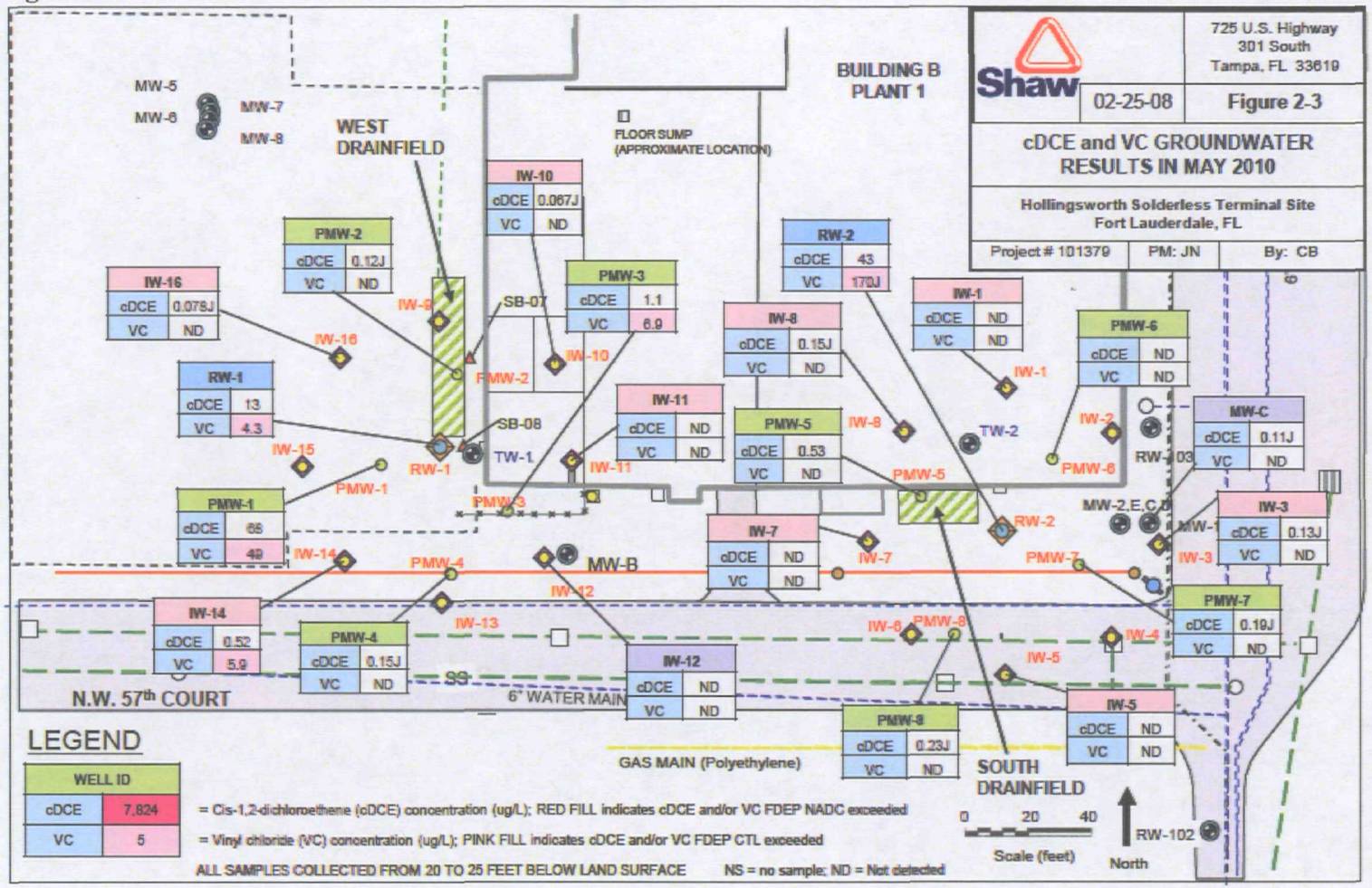
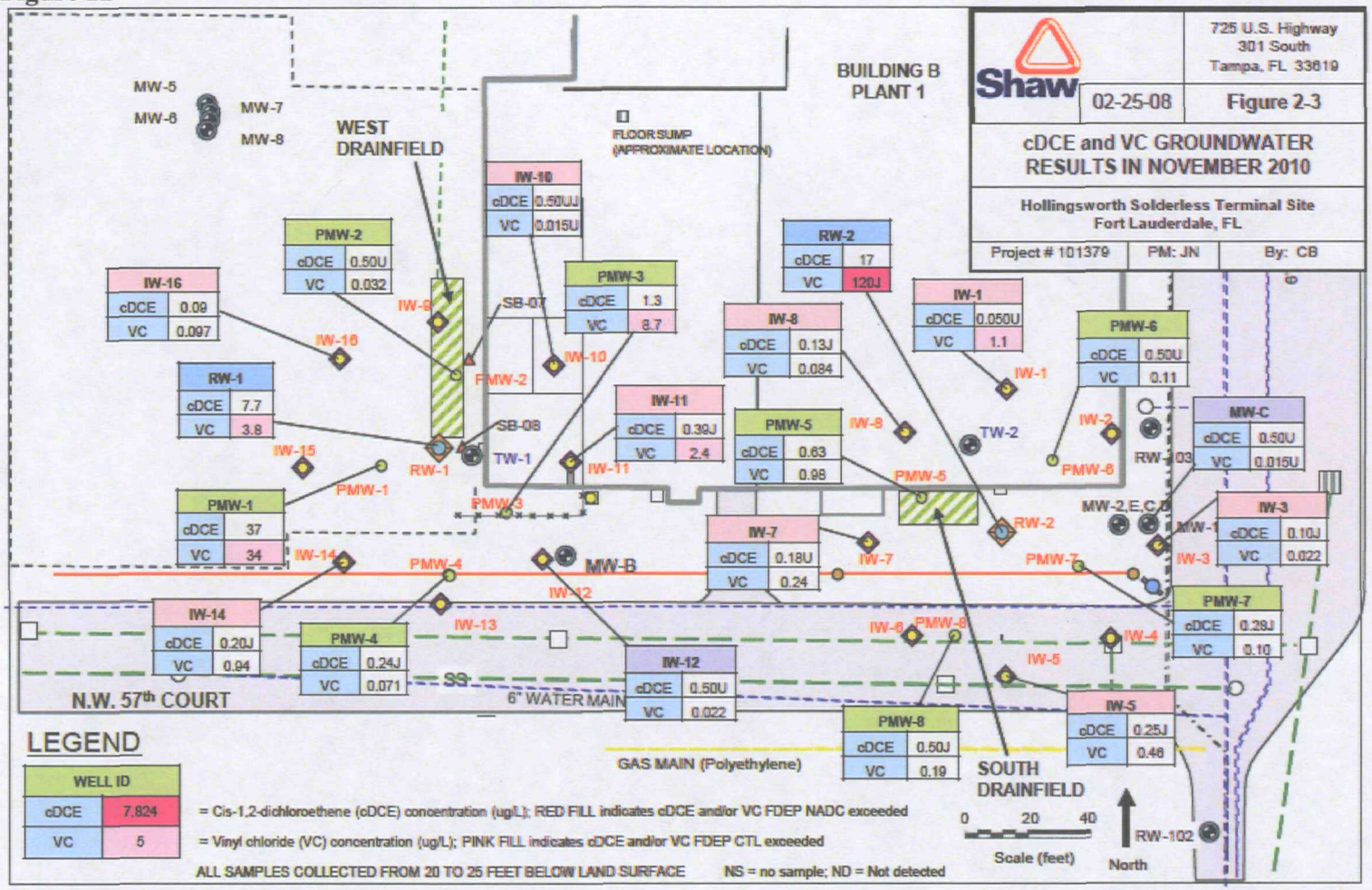

Shaw
725 U.S. Highway 301 South Tampa, FL 33619
02-25-08
Figure 2-3
cDCE and VC GROUNDWATER RESULTS IN MAY 2010
Hollingsworth Solderless Terminal Site
Fort Lauderdale, FL
Project # 101379 PM: JN By: CB
BUILDING B PLANT 1
FLOOR SUMP (APPROXIMATE LOCATION)
WEST DRAINFIELD
SOUTH DRAINFIELD
MW-5
MW-6
MW-7
MW-8
MW-B
MW-C
MW-2.E.C.
RW-1
RW-2
RW-102
TW-1
TW-2
SB-07
SB-08
IW-1 cDCE ND VC ND
IW-2
IW-3 cDCE 0.13J VC ND
IW-4
IW-5 cDCE ND VC ND
IW-6
IW-7 cDCE ND VC ND
IW-8 cDCE 0.15J VC ND
IW-10 cDCE 0.067J VC ND
IW-11 cDCE ND VC ND
IW-12 cDCE ND VC ND
IW-13
IW-14 cDCE 0.52 VC 5.9
IW-15
IW-16 cDCE 0.078J VC ND
PMW-1 cDCE 66 VC 49
PMW-2 cDCE 0.12J VC ND
PMW-3 cDCE 1.1 VC 6.9
PMW-4 cDCE 0.15J VC ND
PMW-5 cDCE 0.53 VC ND
PMW-6 cDCE ND VC ND
PMW-7 cDCE 0.19J VC ND
PMW-8 cDCE 0.23J VC ND
RW-1 cDCE 13 VC 4.3
RW-2 cDCE 43 VC 170J
N.W. 57th COURT
6" WATER MAIN
GAS MAIN (Polyethylene)
LEGEND
WELL ID
cDCE 7,824
VC 5
= Cis-1,2-dichloroethene (cDCE) concentration (ug/L); RED FILL indicates cDCE and/or VC FDEP NADC exceeded
= Vinyl chloride (VC) concentration (ug/L); PINK FILL indicates cDCE and/or VC FDEP CTL exceeded
ALL SAMPLES COLLECTED FROM 20 TO 25 FEET BELOW LAND SURFACE
NS = no sample; ND = Not detected
0 20 40
Scale (feet)
North

Figure 11


Shaw
725 U.S. Highway 301 South Tampa, FL 33619
02-25-08
Figure 2-3
cDCE and VC GROUNDWATER RESULTS IN NOVEMBER 2010
Hollingsworth Solderless Terminal Site Fort Lauderdale, FL
Project # 101379
PM: JN
By: CB
BUILDING B PLANT 1
FLOOR SUMP (APPROXIMATE LOCATION)
WEST DRAINFIELD
SOUTH DRAINFIELD
N.W. 57th COURT
6" WATER MAIN
GAS MAIN (Polyethylene)
MW-5
MW-6
MW-7
MW-8
IW-10 cDCE 0.50UJ VC 0.015U
PMW-2 cDCE 0.50U VC 0.032
IW-16 cDCE 0.09 VC 0.097
PMW-3 cDCE 1.3 VC 8.7
RW-2 cDCE 17 VC 120J
IW-1 cDCE 0.050U VC 1.1
IW-8 cDCE 0.13J VC 0.084
PMW-6 cDCE 0.50U VC 0.11
RW-1 cDCE 7.7 VC 3.8
IW-11 cDCE 0.39J VC 2.4
PMW-5 cDCE 0.63 VC 0.98
MW-C cDCE 0.50U VC 0.015U
PMW-1 cDCE 37 VC 34
IW-7 cDCE 0.18U VC 0.24
IW-3 cDCE 0.10J VC 0.022
IW-14 cDCE 0.20J VC 0.94
PMW-4 cDCE 0.24J VC 0.071
IW-12 cDCE 0.50U VC 0.022
PMW-8 cDCE 0.50J VC 0.19
IW-5 cDCE 0.25J VC 0.46
PMW-7 cDCE 0.28J VC 0.10
IW-9
SB-07
SB-08
TW-1
TW-2
RW-1
RW-2
RW-103
RW-102
PMW-1
PMW-2
PMW-3
PMW-4
PMW-5
PMW-6
PMW-7
PMW-8
MW-B
MW-2,E,C,D
IW-1
IW-2
IW-3
IW-4
IW-5
IW-6
IW-7
IW-8
IW-10
IW-11
IW-12
IW-13
IW-14
IW-15
IW-16
SS
LEGEND
WELL ID
cDCE 7.824
VC 5
= Cis-1,2-dichloroethene (cDCE) concentration (ug/L); RED FILL indicates cDCE and/or VC FDEP NADC exceeded
= Vinyl chloride (VC) concentration (ug/L); PINK FILL indicates cDCE and/or VC FDEP CTL exceeded
ALL SAMPLES COLLECTED FROM 20 TO 25 FEET BELOW LAND SURFACE
NS = no sample; ND = Not detected
0 20 40
Scale (feet)
North

ATTACHMENT 1

List of Documents Reviewed

1. Record of Decision, April 1986
2. Final Remedial Action Report, May 1993
3. First Five-Year Review Final Report, January 1996
4. Second Five-Year Review Final Report, April 2000
5. Third Five-Year Review Final Report, December 2005
6. Final Supplemental Remedial Investigation Report, June 2001
7. Explanation of Significant Differences, October 2001
8. Remedial Action Report, September 2002
9. Letter, Transmittal of August 2002 Analytical Data, from Galo Jackson, USEPA to Marvin Collins, FL-DEP, October 2002
10. Draft Pilot Test Workplan by SHAW Environmental, December 2004
11. Pilot Test Vital Signs Report, by SHAW Environmental, April 8-29, 2005
12. In-Situ Enhanced Biormemediation (ISEB) Progress Report, February 2008
13. Record of Decision Amendment, November 2008

ATTACHMENT 2

Applicable or Relevant and Appropriate Requirements (ARARs)

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
Groundwater/ SDWA	Federal - SDWA - Maximum Contaminant Levels (MCLs) (40 CFR Part 141)	Relevant and Appropriate	Standards (MCLs) have been adopted as enforceable standards for public drinking water systems: goals.	Bioremediation of contaminated material in soils and groundwater will eliminate contaminants in the groundwater. MCLs will be attained in groundwater.
Groundwater/ SDWA	Florida State Drinking Water Standard - F.A.C.62-520 and 62-550	Relevant and Appropriate	Maximum contaminant levels are established for organic chemical contaminants under F.A.C.62-520 and 62-550.	The selected remedy will attain State MCLs for organics in the groundwater, with the possible exception of trichloroethene. The Cleanup Goal in the ROD is set at 3.2 ug/L, which is more stringent than Federal MCLs, but is slightly more relaxed than the State MCL of 3 ug/L.

ATTACHMENT 3

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: HOLLINGSWORTH SOLDERLESS TERMINAL	Date of inspection: 4/28/2011
Location and Region:	EPA ID:
Agency, office, or company leading the five-year review: U.S. EPA REG 04	Weather/temperature: SUNNY

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☒ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other EXCAVATION, SVE
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☒ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions: ☐ Report attached _____

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions: ☐ Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☐ Report attached.

(SEE Section "VI. FIVE-YEAR REVIEW PROCESS", subsection "INTERVIEWS")

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
	☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
2.	**Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	☒ N/A
	G Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
3.	**O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	G☒N/A
	☐ Other permits	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒G N/A
	Remarks			
7.	**Groundwater Monitoring Records**	☒ Readily available	☐ Up to date	☐ N/A
	Remarks			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			

IV. O&M COSTS

1. **O&M Organization**
   - ☐ State in-house
   - ☐ PRP in-house
   - ☐ Federal Facility in-house
   - ☐ Other_____
   - ☐ Contractor for State
   - ☐ Contractor for PRP
   - ☐ Contractor for Federal Facility

2. **O&M Cost Records**
   - ☐ Readily available ☐ Up to date
   - ☐ Funding mechanism/agreement in place
   - Original O&M cost estimate_____ ☐ Breakdown attached

   Total annual cost by year for review period if available

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐Gates secured ☐ N/A
   Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
   Remarks_____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
   Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A
   Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

☐
Type of monitoring (*e.g.*, self-reporting, drive by) _____
Frequency _____
Responsible party/agency _____
Contact _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☐ No ☐ N/A
Other problems or suggestions: G Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks _____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks _____

2. **Land use changes on site** ☒ N/A
Remarks _____

3. **Land use changes off site** ☒ N/A
Remarks _____

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
Remarks _____

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths _____ Widths _____ Depths _____
   Remarks _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent _____ Depth _____
   Remarks _____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent _____ Depth _____
   Remarks _____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks _____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks _____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent _____ Height _____
   Remarks _____

9.	**Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability Areal extent_____ Remarks_____
B. Benches	☐ Applicable ☐ N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)
1.	**Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay Remarks_____
2.	**Bench Breached** ☐ Location shown on site map ☐ N/A or okay Remarks_____
3.	**Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay Remarks_____
C. Letdown Channels	☐ Applicable ☐ N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)
1.	**Settlement** ☐ Location shown on site map ☐ No evidence of settlement Areal extent_____ Depth_____ Remarks_____
2.	**Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation Material type_____ Areal extent_____ Remarks_____
3.	**Erosion** ☐ Location shown on site map ☐ No evidence of erosion Areal extent_____ Depth_____ Remarks_____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

B. Cover Penetrations G Applicable ☒N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks_____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   G☐Good condition ☐ Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)
   ☐ Good condition ☐ Needs Maintenance ☐N/A
   Remarks_____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning G☐N/A
   Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
   Remarks_____

G. Detention/Sedimentation Ponds ☐Applicable ☒ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
   ☐ Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   ☐ Erosion not evident
   Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
   Remarks_____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☒ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   ☐ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** ☐ Functioning ☐ N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☐ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   ☐ Performance not monitored
   Frequency_____ ☐ Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A	
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (Check components that apply)
   - ☐ Metals removal
   - ☐ Oil/water separation
   - ☐ Bioremediation
   - ☐ Air stripping
   - ☐ Carbon adsorbers
   - ☐ Filters _____
   - ☐ Additive (*e.g.*, chelation agent, flocculent) _____
   - ☐ Others _____
   - ☐ Good condition
   - ☐ Needs Maintenance
   - ☐ Sampling ports properly marked and functional
   - ☐ Sampling/maintenance log displayed and up to date
   - ☐ Equipment properly identified
   - ☐ Quantity of groundwater treated annually _____
   - ☐ Quantity of surface water treated annually _____
   - Remarks _____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   - ☐ N/A
   - ☐ Good condition
   - ☐ Needs Maintenance
   - Remarks _____

3. **Tanks, Vaults, Storage Vessels**
   - ☐ N/A
   - ☐ Good condition
   - ☐ Proper secondary containment
   - ☐ Needs Maintenance
   - Remarks _____

4. **Discharge Structure and Appurtenances**
   - ☐ N/A
   - ☐ Good condition
   - ☐ Needs Maintenance
   - Remarks _____

5. **Treatment Building(s)**
   - ☐ N/A
   - ☐ Good condition (exp. roof and doorways)
   - ☐ Needs repair
   - ☐ Chemicals and equipment properly stored
   - Remarks _____

6. **Monitoring Wells** (pump and treatment remedy)
   - ☐ Properly secured/locked
   - ☐ Functioning
   - ☐ Routinely sampled
   - ☐ Good condition
   - ☐ All required wells located
   - ☐ Needs Maintenance
   - ☐ N/A
   - Remarks _____

D. Monitoring Data

1. Monitoring Data
   - ☒ Is routinely submitted on time
   - ☐ Is of acceptable quality

2. Monitoring data suggests:
   - ☒ Groundwater plume is effectively contained
   - ☒ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☒ All required wells located ☐ Needs Maintenance ☐ N/A

Remarks _____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Attachment 4

SUN SENTINEL

Published Daily

Fort Lauderdale, Broward County, Florida

Boca Raton, Palm Beach County, Florida

Miami, Miami-Dade County, Florida

STATE OF FLORIDA

COUNTY OF BROWARD/PALM BEACH/MIAMI-DADE

Before the undersigned authority personally appeared *Lana L. Reed* who on oath says that he/she *is* a duly authorized representative of the Classified Department of the Sun-Sentinel, daily newspaper published in Broward/Palm Beach/Miami-Dade County, Florida that the attached copy of advertisement, being, a *PUBLIC NOTICE* in the matter of *U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 4 – HOLLINGSWORTH SOLDERLESS TERMINAL SUPERFUND SITE* appeared in the paper on *April 30, 2011* AD ID *2401870* Affiant further says that the said Sun-Sentinel is a newspaper published in said Broward/Palm Beach/ Miami-Dade County, Florida, and that the said newspaper has heretofore been continuously published in said Broward/Palm Beach/Miami-Dade County, Florida, each day, and has entered as second class matter at the post office in Fort Lauderdale, in said Broward County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant says that he/she has neither paid, nor promised, any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in said newspaper.

Lana L. Reed

Lana L. Reed, Affiant

Sworn to and subscribed before me on 2 May, 20110 A.D.

NOTARY PUBLIC-STATE OF FLORIDA
Karen Goldberg
Commission # DD720119
Expires: NOV. 16, 2011
BONDED THRU ATLANTIC BONDING CO., INC.

Karen Goldberg

(Signature of Notary Public)